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A MONOGRAPH
OF THE
CORACIIDÆ,
OR
FAMILY OF THE ROLLERS.

BY

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* Ἀλλοτε μὲν πρηνὴς, ὅτε δ' ὕπτιος αἰθέρα τάμνεις,
ἔξοχος ἐκ πτηνοῦ γλαυκὸν ἄγαλμα γένους·
εἰ δὲ πρέπεις ἄλλοισι διακριδὸν ἐν πετεηνοῖς,
πῶς ἀκλεὴς ἐγένου τοῦνομ' ἔχων κόρακος ;

A. G. P.

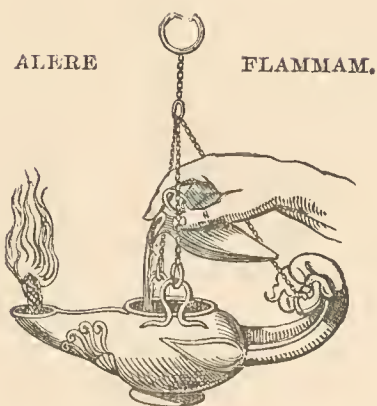
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TO

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IN APPRECIATION

OF AN

UNINTERRUPTED FRIENDSHIP

EXTENDING OVER A PERIOD OF MORE THAN THIRTY YEARS,

THIS WORK IS DEDICATED

BY

HIS SINCERE FRIEND AND ADMIRER,

THE AUTHOR.

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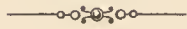
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P R E F A C E.



NEARLY ten years ago, before the issue of my ‘Monograph of the Meropidæ,’ I commenced the present companion work, and in 1885 all the plates of the then known species had been drawn on stone. Lack of information and various other causes had, however, delayed its publication until 1890, when all was ready for placing in the printers’ hands. I was then, however, informed that my friend and late colleague Dr. Sharpe had nearly completed his portion of the British Museum Catalogue which contains the Coraciidæ, and deeming it advisable to defer the issue of my volume until Dr. Sharpe’s had appeared, in order that I might check and verify my work by comparison with his, I put my MS. aside.

As will be seen, he and I agree closely in all but minor details—the chief differences being that I have not found it advisable to separate the Rollers into two families, but have reduced *Leptosomus* to a subfamily of the Coraciidæ; and, moreover, I have not recognized Dr. Sharpe’s genus *Geobiastes*, as I cannot, after a most careful comparison, detect any valid generic character by which it can be separated from *Brachypteracias*.

During the progress of the present work I have, as heretofore, been greatly indebted to many fellow naturalists both at home and abroad for much valuable assistance. To Professor A. Newton I am especially indebted for having looked over my proofs, and for having given me his opinion on various moot points, as also for having lent me specimens from the Cambridge Museum; Major R. G. Wardlaw Ramsay placed at my disposal the entire series of Rollers belonging to the Tweeddale collection before depositing them in the British Museum; Canon Tristram and Mr. Henry Seebohm lent me for examination the Rollers in their collections; Mr. Trimen obtained permission from the Trustees of the South-African Museum, Capetown, and forwarded to me the type of *Coracias spatulatus*, which I have figured; Professor Barboza du Bocage and Dr. Anton Reichenow have on several occasions assisted me with information respecting the specimens in the Lisbon and Berlin Museums; and the Hon. Walter Rothschild has at all times lent me specimens from the valuable collection at Tring. Besides which the large series of Rollers in the British Museum has always been available for examination. To all the above gentlemen as well as to others who have aided me, whose names will be found in the body of the work, I take this opportunity of tendering my sincere thanks.

Mr. Frank E. Beddard, Prosector to the Zoological Society, has kindly undertaken the same portion of the work which he so ably executed in my 'Monograph of the Meropidæ,' and to him I am therefore indebted for the notes on the Anatomy &c. of the Coraciidæ in the Introduction.

The present will probably be the last Monograph I shall undertake; but I hope to publish shortly a 'Supplement to the Birds of Europe,' of which a considerable portion is already written and for which nearly forty Plates have been executed.

H. E. DRESSER.

Topclyffe Grange, Farnborough, Kent.
30th September, 1893.

INTRODUCTION.



GENERAL REMARKS.

As stated in the Introduction to my 'Monograph of the Meropidæ,' the Rollers must be ranged very close to both the Bee-eaters and the Jacamars, and the result of subsequent studies, extending over the past seven years, has further confirmed that view. This will be seen by the following notes, for which I am indebted to Mr. Beddard; he considers that the nearest allies of the Coraciidæ are the Meropidæ, the Galbulidæ, and the Bucconidæ, the first of which is the most closely related.

"GENERAL CHARACTERS AND ANATOMY.

"The anatomy of the Coraciidæ has been investigated by Nitzsch, Huxley, Garrod, Gadow, Fürbringer, Forbes, Sclater, and others; I have but few details to add to the facts accumulated by these authors.

"The principal anatomical characters that have been of use for systematic purposes have been so fully and ably discussed by Fürbringer, in his great work upon bird anatomy, and by Gadow that it is unnecessary to enter upon the matter at length here.

"The following is a list of the characters :—

"(1) The oil-gland is nude.

"(2) The dorsal feather-tract has a median apterium.

"(3) There are 12 rectrices.

"(4) The skull is desmognathous, with rudimentary basipterygoid processes.

"(5) Both carotids are present.

“(6) The cæca are functional (2 inches long in a specimen of *Coracias garrula* ; $1\frac{1}{2}$ inch in *Eurystomus*).

“(7) The *expansor secundariorum* is present.

“(8) Of the leg-muscles important for classificatory purposes the *ambiens* is absent, the *semitendinosus*, *accessory semitendinosus*, and *femoro-caudal* are present ; the formula being thus (on Garrod’s principle) A X Y.

“(9) The deep flexor tendons of the foot become completely fused before giving off the four branches to the toes.

“PTERYLOSIS.

“The pterylosis of the Coraciidæ has been described by Nitzsch * ; in a few very small particulars I am able to supplement his account. My observations were made for the most part upon a single specimen of *Eurystomus orientalis*.

“The lower surface of the throat is not continuously feathered, but the two ventral tracts are recognizable from the very first : up to the level of the ear they gradually increase in width from one feather up to about three ; just at the ear the ventral tracts become continuous with the feathering at the back of the head ; but this continuity only exists for a very short space, each ventral tract soon recovering its independence. Nitzsch figures the pterylosis of *Coracias garrulus* as if there were a close and continuous feathering of the throat between the mandibles : I have examined a specimen of this species and find that it differs in no way from *Eurystomus orientalis*. On the breast itself the feather-tract appears to me to be correctly figured by Nitzsch ; the strongly feathered main tract, four to six feathers wide, is bordered by a weaker and more scattered feathering, which, however, leaves the median ventral line quite bare ; a line of strong feathers goes to the hypopteron.

“The dorsal pterylosis commences with a continuous covering of the back and top of the head ; it narrows gradually (this is not clear in Nitzsch’s figure) until between the shoulders, where the feathering is very strong and whence it divides into two narrow tracts ; these unite again just at the articulation of the femora, and finally terminate a little way in front of the oil-gland.

“SYRINX.

“The *syrinx* of *Coracias garrulus* is quite a typical tracheo-bronchial syrinx. The last tracheal ring makes a three-way piece behind, and to the following ring, the first bronchial semiring, are attached the intrinsic syringeal muscles ; these are slender above, but fanned out at their insertion. These first bronchial semirings are the only ones that are ossified ; the rest are not only much more slender, but soft and cartilaginous.

* ‘Pterylography,’ Engl. ed. by Selater.

“The syrinx of *Eurystomus* is constructed upon quite the same plan as that of *Coracias*. There are, however, as one would perhaps expect, a few differences of detail. These differences concern the bronchial semirings. The muscles are attached, as in *Coracias*, to the first bronchial semirings, but the following semirings show much more specialization than they do in *Coracias*. The second are much more closely attached to the first and appear to be ossified; following these again are two pairs of semirings which are very narrow indeed and also appear to be ossified; then comes the series of flatter, broader, soft cartilaginous rings. The width of the syrinx is greatest at the third semiring; in *Coracias* at the first.

“The syrinx of *Leptosomus discolor* has been described and figured by Forbes; he remarks that it ‘does not show much similarity of form to that of *Coracias garrulus*.’ That is perfectly true, but it does show some resemblance to that of *Eurystomus*, which I have described above, I believe for the first time. The intrinsic muscles are, however, inserted on to the third bronchial semirings; but these first three rings are ossified and closely applied to each other as they are in *Eurystomus*; they are, however, broader than in the syrinx of the last-named bird.

“The genus *Leptosomus*, known to us from the memoirs of Sclater* and Forbes†, is in a few respects different from other Coraciidæ; the differences, however, do not affect the characters given in the above list, they chiefly relate to the pterylosis and to the form of the syrinx. The powder-down patches of *Leptosomus* were discovered by Sclater; the pterylosis has been described in some detail by Forbes. The inferior tract does not become double until a point about an inch behind the junction of the mandibular rami; at about the middle of the breast it gives off the slightly marked outer pectoral tracts, which are hardly at all marked in *Coracias*.

“The assemblage of characters given in the above list distinguishes the Coraciidæ from any other family of birds. In having a nude oil-gland, cæca, and pectoral tract with external branch given off beyond middle of breast, the Coraciidæ fall into the division ‘Passeriformes’ of Garrod’s ‘Anomalogonata.’ Their nearest allies in this group are doubtless the Meropidæ, Bucconidæ, and Galbulidæ. The remaining groups, that of the Passeres and Trogonidæ, may be put aside.

“The Coraciidæ, however, differ from all these, except the Meropidæ and Galbulidæ, in the presence of that peculiar muscle so rare in the Picarian birds—the *expansor secundariorum*. The Galbulidæ and the Bucconidæ, however, have a peculiar arrangement of the deep flexor tendons not found in the Coraciidæ; the *flexor hallucis* supplies three digits, and is united by a vinculum only with the other flexor. In fact the Meropidæ on the whole appear to be the nearest allies of the Coraciidæ, but they only possess one carotid.”

* P. Z. S. 1865, p. 682; reprinted in Nitzsch’s ‘Pterylography,’ in Appendix.

† P. Z. S. 1880, p. 465.

HISTORY OF THE ROLLERS.

It has been remarked as a singular fact that of all the bright-coloured birds which are met with in Southern Europe, the Roller appears to have been unknown to Aristotle and the ancient naturalists, and the earliest recognizable description is that given in 1555 by Gesner, who states that the species was known in the neighbourhood of Strasburg as the Roller, from its mode of flight. He adds that he remembered having seen it also near Bologna, in Italy; but it is another singular fact that the bird seems to have been also unknown to his contemporary Belon, oriental traveller as he was. Aldrovandus, as usual, copied Gesner's account, to which he had little or nothing to add; but Schwenckfeld, in 1603, gave a very good and recognizable description—evidently original—of the species under the name of *Cornix cærulea*.

I do not propose, however, to give a review of all the early literature, but, as I did in the Introduction to the Meropidæ, to commence with Brisson, who in 1760 included in his 'Ornithologia' ten species of Rollers, but of these only four—viz. *Galgulus* (*Coracias garrulus*), *Galgulus mindanensis* (*Coracias indicus*), *Galgulus angolensis* (*Coracias caudatus*), and *Galgulus indicus* (*Eurystomus orientalis*)—appear to be true Rollers. He includes them all under the generic title of *Galgulus* and places them between *Nucifraga* and *Icterus*.

Linnaeus, in the 12th edition of his Syst. Nat. (1766), first gave the generic name of *Coracias* and includes six species, viz. *Coracias garrula* *, *Coracias indica*, *Coracias caffra* (?), *Coracias orientalis* (*Eurystomus orientalis*), *Coracias bengalensis* (*Coracias indicus*), and *Coracias caudata*.

P. L. S. Müller, in the Supplement to his 'Natursystem,' p. 86 (1776), described two Rollers, viz. *Coracias glaucurus* (*Eurystomus glaucurus*) and *Coracias leucocephalus*, which may possibly be *Coracias abyssinicus*, but the description is too indefinite to enable me to say with certainty to which species it refers. He says "it is rust-coloured above, blue below, white on the forehead, cheeks, and throat; the central tail-feathers are green and the outer ones black and very long; the feet are yellow spotted with white. This bird inhabits Senegal."

D'Aubenton in 1775, in the 'Planches Enluminées,' figured the following Rollers, viz. *Leptosoma discolor* (pls. 587, 588), *Coracias indicus* (pl. 285), *Coracias abyssinicus* (pls. 326, 626), *Coracias caudatus* (pl. 88), *Eurystomus glaucurus* (pl. 501), and *Eurystomus orientalis* (pl. 619).

In a rather scarce work ('Tabula Affinitatum Animalium etc.'), Johannes Hermann, in 1783, described as a Cuckoo, under the name of *Cuculus discolor*, the curiously aberrant Roller from Madagascar which now stands under the name of *Leptosomus discolor*, and in the same work he also gives the name of *Coracias madagascariensis* to the Roller described by P. L. S. Müller in 1776

* It may not be amiss to remark that the word *κορακίας*, used by Aristotle for the Cornish Chough, is of the masculine gender, and so it has been regarded by Brisson, P. L. S. Müller, and others; but when Linnaeus adopted it as a generic name in his 12th edition, he, whether by accident or design none can say, made it feminine, and his practise has been followed by many writers. In the 10th edition he had *Coracias Garrulus*, signifying that the second word was a substantive. Hence the discrepancy to be observed (as in the case of *Coracias garrulus* or *garrula*) throughout this work.

under the name of *Coracias glaucurus* (*Eurystomus glaucurus*). In the same year Boddaert ('Table des Planches Enluminées') published a list of D'Aubenton's plates, to which he gave scientific names, and amongst others he gave the name *Coracias abyssinicus* to the bird figured on pl. 626, and *Cuculus æneus* to those on plates 587, 588, which latter stands, however, as *Leptosomus discolor* (Herm.).

J. G. Gmelin, in the 13th edition of Linnæus's Syst. Nat. (1788), enumerates the species of Rollers described by Linnæus in his 12th edition, besides several other species which do not belong to the genus *Coracias*, and adds the following, viz. *Coracias abyssinica*, *Coracias senegalensis* (*C. abyssinicus*), *Coracias madagascariensis* (*Eurystomus glaucurus*), and (placed amongst the Cuckoos under the name of *Cuculus afer*) *Leptosomus discolor*.

In 1790 Latham gave a list of the Rollers so far as he was able, but did not add any new information respecting them; and ten years later Daudin, in his 'Traité élémentaire et complet d'Ornithologie,' pp. 257–268, includes nine Rollers, viz. *Coracias garrula*, *C. nœvia*, *C. bengalensis*, *C. caudata*, *C. abyssinica*, *C. senegala*, *C. orientalis*, *C. madagascariensis*, and *C. afra*, besides including under the genus *Coracias* twelve other species which do not belong to that genus. Of these *Coracias nœvius* is here first described.

Latham, in the Supplement to his 'Index Ornithologicus,' gave in 1801 the name of *Coracias pacifica* to the bird described by him in Supplement ii. to the 'Gen. Syn.' p. 371; and though his description of the bird is decidedly bad, yet the locality given, New Holland, leaves no doubt that it refers to the Australian Broad-billed Roller, especially as this is the only Roller inhabiting Australia; hence Latham's specific name has with justice been almost universally adopted. Edwards ('Gleanings,' iii., 1806) gives fairly good plates of two Rollers, viz. pl. 326, Blue Jay from the East Indies (*C. indicus*), and pl. 327, Swallow-tailed Indian Roller (*C. abyssinicus*); and I may here remark that in 1750, in his well-known 'Natural History of Birds,' Edwards gave a very fair representation of the Common Roller.

Levaillant also in 1806, in his 'Hist. Nat. Roll. et Geais,' gives plates of the following Rollers—No. 25, Le Rollier à longs brins d'Afrique (*Coracias abyssinicus*); No. 26, Le Rollier à ventre bleu (*Coracias cyanogaster*); No. 27, Le Rollier varié des Moluques (?); No. 28, Le Rollier varié d'Afrique (*Coracias indicus*); No. 29, Le Rollier varié d'Afrique dans son jeune âge (*Coracias nœvius*); Nos. 32 & 33, Le Rollier vulgaire (*Coracias garrulus*); No. 34, Le Grand Rolle violet (*Eurystomus glaucurus*); No. 35, Le petit Rolle violet (*Eurystomus afer*); No. 36, Le petit Rolle violet à gorge bleu (*Eurystomus gularis*) and Le Rolle à gorge bleu (*Eurystomus orientalis*); and No. 46 (Suppl.), Le Rollier Temminck (*Coracias temmincki*).

Three years later Shaw (Gen. Zool. vii. part ii. pp. 388–405) gave a list of the different species of Rollers known to him, nine in number, viz.:—*Coracias garrula*, *C. indica*, *C. albifrons* (*C. abyssinicus*), *C. angolensis* (*C. caudatus*), *C. caffra* (?), *C. pacifica* (*Eurystomus pacificus*), *C. orientalis* (*E. orientalis*), *C. madagascariensis* (*E. glaucurus*), and *C. afra* (*E. afer*).

In 1816 Vieillot (Analyse d'une nouvelle Orn. élément.) established two new genera: p. 28, *Leptosomus* (type *L. discolor*), and p. 37, *Eurystomus* (type *E. orientalis*).

The following year Cuvier ('Règne Animal,' p. 401) proposed the genus *Colaris* to include the Broad-billed Rollers, and first gave the scientific name of *Coracias cyanogaster* to Levaillant's Rollier à ventre blue (pl. 26).

In 1819 Vieillot (Nouv. Dict. d'Hist. Nat. pp. 425–436) included in his list of Rollers, besides several not referable to this family, seventeen species, viz.:—*Eurystomus cyanocollis* and *fuscicapillus* (*Eurystomus orientalis*), *E. gularis*, *E. rubescens* (*E. afer*), *E. violaceus* (*E. glaucurus*), *E. purpurascens* (*E. afer*), *Galgulus garrulus* (*Coracias garrulus*), *Coracias caudata*, *Coracias pilosa* (*C. nævius*), *Garrulus nævius* (*Coracias indicus*), *Coracias indica*, *Galgulus caudatus* (*Coracias caudatus*), *Coracias senegala* (*C. abyssinicus*), *Coracias nævia*, *Garrulus temminckii* (*Coracias temmincki*), *Coracias pacifica* (*Eurystomus pacificus*), and *Garrulus cyanogaster* (*Coracias cyanogaster*),—and here first described *Eurystomus gularis* and gave the name *temminckii* to Levaillant's Rollier Temminck.

In 1823 Vieillot gave another list of the Rollers (Tabl. Encycl. et Méthod. pp. 866–872), much the same as that in the Nouv. Dict., placing all the *Coraciæ* under the genus *Galgulus*, and the *Eurystomi* under *Eurystomus*.

In 1827 Wagler (Syst. Avium) gave a review of the family, grouping the species in two sections, *Coracias* and *Colaris*; and in 1832 Lesson (Ill. Zool. pl. 20) described and figured *Brachypteracias leptosomus*, placing it in the genus *Colaris*.

In 1834 Lafresnaye (Rev. et Mag. de Zool.) instituted the genus *Brachypteracias*, the type being *B. leptosomus*, and in the same volume (pl. 32) he described and figured *Atelornis pittoides* under the name of *Brachypteracias pittoides*.

In 1837 Swainson (Classif. of B. ii. p. 333) proposed the genus *Chloropygia* for *Brachypteracias*, and in the following year (Rev. et Mag. de Zool. pl. 224) Lafresnaye described and figured *Brachypteracias squamiger*.

In 1839 MacClelland (P. Z. S. 1839, p. 164) described *Coracias affinis*, and in 1845 Rüppell (Syst. Uebers. p. 23) included in his list of the birds of Abyssinia *Coracias nævius* under the name of "*Coracias levaillantii*, Temm.;" but I have been unable to find where Temminck made use of this specific name. In the same year Gray (Gen. of B. i. p. 61) gave a list of the Rollers and figured *Coracias affinis*, and in 1846 Pucheran (Rev. Zool. 1846, p. 200) proposed the genus *Atelornis*, the type being *A. pittoides*.

Reichenbach in 1852 ('Meropinæ,' pp. 45, 57) gave a review of the family, proposing the generic title of *Crombus* in place of *Leptosomus*, and divided the genus *Eurystomus* into two sections, *Eurystomus* and *Colaris*, and he also figured all the known species of Rollers; and in 1854 Bonaparte (Consp. Volucr. Anisod. p. 7) defined two new genera, *Coraciura* (type *Coracias cyanogaster*) and *Corapitta* (type *Atelornis pittoides*), neither of which, however, stand. Dr. Sharpe remarks (Cat. B. Brit. Mus. xvii. p. 7) that the latter name should have been written *Coracopitta* instead of *Corapitta*.

In 1860 Cabanis and Heine (Mus. Hein. pt. ii. p. 119) proposed to include *Eurystomus afer*, *E. glaucurus*, and *E. gularis* in a new genus, *Cornopio*, the type being the first-named species; and the same year Gray (P. Z. S. 1860, p. 346) described *Eurystomus azureus*, a very distinct and good species inhabiting the Moluccas.

In 1865, in a very exhaustive review of *Leptosomus discolor*, Dr. Sclater (P. Z. S. 1865, pp. 682–689) considers the position of *Leptosomus*, and after treating of the external characters of the head, the pterylogy, &c., expresses the opinion that *Leptosomus* should be made the type of a separate family near the Coraciidæ, with which it is perhaps connected by *Brachypteracias*. Figures are given of the head, the skull, feathers from the back and breast, the upper surface with the feathers removed, the sternum, and the tongue and hyoid bones.

The following year (1866) Diggles figured (Orn. Austral. part v.) *Eurystomus australis*, and Gould (B. of Great Brit. part x.) *Coracias garrulus*.

In 1869 Gould (B. of Asia, part xxi.) figured *Coracias indicus*, *C. affinis*, and *C. temmincki*, and Dr. Sclater (P. Z. S. 1869, p. 121) described *Eurystomus crassirostris*.

Two years later ('Ibis,' 1871, pp. 184–203, 270–289), Dr. Sharpe gave a most valuable monographic review of the Coraciidæ of the Ethiopian Region, in which he proposed a new genus *Geobiastes*, to contain a single species, *Brachypteracias squamiger*, which, however, I have not deemed it advisable to recognize, as I cannot find any valid character by which it can be separated from *Brachypteracias*. *B. squamiger*, compared with *B. leptosomus*, has the tarsus rather longer, therein resembling *Atelornis*, and the tail is somewhat shorter, but I can detect no difference either in the wing or bill between the two species, and have therefore placed both in the genus *Brachypteracias*.

In the same year Dr. Sharpe and myself figured *Coracias garrulus* in the 'Birds of Europe' (pl. 293), and Mr. D. G. Elliot described ('Ibis,' 1871, pp. 203–204), under the name of *Eurystomus waigiouensis*, a Roller which has since been shown to be specifically inseparable from *E. crassirostris*.

In 1873 the Roller from the Solomon Islands was figured in Brenchley's 'Cruise of the Curaçoa,' pl. iii., under the name of *Eurystomus crassirostris*. This species was described by Dr. Sharpe in 1890 under the name of *Eurystomus solomonensis*.

Two years later Dr. Sharpe described and figured a very distinct species of Ground-Roller, *Atelornis crossleyi*, from Madagascar (P. Z. S. 1875, p. 74, pl. xiv.).

Between 1875 and 1880 I find nothing of any importance on record respecting the Rollers, but in the latter year Garrod published (P. Z. S. 1880, pp. 465–475) a most important paper on the anatomy of *Leptosomus discolor*, figuring the foot, the wing-muscles, the plantar tendons, and the syrinx, and giving a table of affinities between *Leptosomus*, *Cuculus*, and *Coracias*, showing that in every respect *Leptosomus* is very closely allied to *Coracias* and should in any case be placed next to the Coraciidæ or else relegated to the position of a subfamily of the Coraciidæ. In the same year Mr. Trimen described (P. Z. S. 1880, pp. 30–33) *Coracias spatulatus* from South Africa, and Professor

Barboza du Bocage (J. Sc. Lisb. vii. p. 227) described under the name of *Coracias dispar* the same species from Angola.

In 1885 Captain Shelley ('Ibis,' 1885, p. 399) described *Coracias lorti* and pointed out the differences between the white-naped and the olive-crowned Rollers, treating the latter, however, only as a subspecies under the name of *Coracias naevia levaillanti*.

In 1887 Prof. Giglioli and Manzella (Icon. Avif. Ital. pl. xxxvi.) figured *C. garrulus*, and in 1890 Dr. Sharpe published (P. Z. S. 1890, pp. 546, 552) an article on the Coraciidæ of the Indian Region, in which he subdivided *Eurystomus orientalis* into three species—*E. orientalis*, *E. lætior*, and *E. calonyx*, and separated the Solomon Island Broad-billed Roller from *Eurystomus crassirostris*, giving it the name of *Eurystomus solomonensis*.

The same year I described *Coracias weigalli* (Ann. & Mag. Nat. Hist. (6) vi. p. 351) and ('Ibis,' 1890, p. 386) gave the name of *Coracias mosambicus* to the Olive-crowned Roller.

In the following year ('Ibis,' 1891, pp. 99–102) I published a few brief notes on *Eurystomus orientalis*, showing that *E. lætior* and *E. calonyx* could not be specifically separated from *E. orientalis*, and that these two names would therefore sink into synonyms of this species.

In 1892 the long-delayed vol. xvii. of the 'Catalogue of Birds in the British Museum' was at last published, and in it appeared the Coraciidæ by Dr. Sharpe, who therein separates the Rollers into two families, Leptosomatidæ and Coraciidæ, and these again into six genera, *Leptosoma*, *Brachypteracias*, *Geobiastes*, *Atelornis*, *Coracias*, and *Eurystomus*. As regards the species, of which he recognizes twenty-five besides two subspecies, he does not acknowledge *Coracias weigalli*, and renames the Olive-crowned Roller *Coracias olivaceiceps*, but still retains *Eurystomus lætior* and *E. calonyx*, including the former, however, only as a subspecies.

CLASSIFICATION.

Full particulars of the position of the Rollers towards the other allied families are given above, and as regards the differences between the subfamilies and genera, particulars of their distinctive characters are given in the body of the work, so that they do not require to be recapitulated here. The present family has not been so much subdivided by different authors as have some of those allied to it, and I have therefore not made much alteration in the views adopted by my predecessors. I have thus divided the family into three subfamilies, two of which are confined to Madagascar. The first of these subfamilies, the *Coraciinæ*, contains two genera, *Coracias* and *Eurystomus*; the second, the *Brachypteraciinæ*, also two, *Brachypteracias* and *Atelornis*; and the third, the *Leptosominæ*, but one genus; the total number of genera being five. Herein I differ from my immediate predecessors, who make a separate family of the *Leptosominæ* instead of a subfamily, and divide the *Brachypteraciinæ* into three genera instead of two.

HABITS AND DISTRIBUTION.

As a rule the Rollers are forest-haunting birds, or at least they do not affect open places, except gardens and such localities where there is an abundant tree or bush growth, and many of the species are inhabitants of the true forest far away from the haunts of men. With the exception of those included in the genera *Brachypteracias* and *Atelornis*, they are arboreal in their habits, and are generally seen amongst the taller trees; and all the species are usually found singly or in pairs, and are not gregarious in their habits. The Ground-Rollers and Pitta-Rollers, which are confined to the forest-regions of Madagascar, are, however, not arboreal, but are usually to be met with on the ground or on low bushes, and are said to be to some extent crepuscular. All the species appear to have a harsh and discordant note, as is the case with their near relatives the Bee-eaters.

The Ground-Rollers and Pitta-Rollers are said to nest in holes in the ground or amongst the roots of old trees, and to deposit white eggs slightly marked; but all the other species nest in hollow trees, not making any nest, but depositing their pure white glossy eggs on the débris at the bottom of the nest-hole.

Full particulars, so far as they are known, respecting the habits &c. of the various species will be found in the body of the work.

The Rollers are essentially representative species of the Old World, none occurring in the Nearctic or Neotropical Regions, and, like the Bee-eaters, most of the species are confined to the Ethiopian Region. Thus, out of the twenty-six known species, eighteen inhabit that Region, and of these seventeen are peculiar to it. In the Palæarctic Region this family is but poorly represented, as only one species, *Coracias garrulus*, inhabits the western portion and one, *Eurystomus orientalis*, the eastern portion, a third, *Coracias indicus*, being a rare straggler to the extreme south-eastern portion of the Western Palæarctic Region. The Indian Region is inhabited by three species of *Coracias* and one *Eurystomus*; and the Australian Region by one of *Coracias* and four of *Eurystomus*, all of which are restricted to this Region. The genera *Brachypteracias*, *Atelornis*, and *Leptosomus* are confined exclusively to the Ethiopian Region.

In the subjoined Table (p. xx) I give the precise distribution of the different species of Rollers.

TABLE OF THE GEOGRAPHICAL DISTRIBUTION OF THE CORACIDÆ.

	PALEARCTIC REGION.								ETHIOPIAN REGION.					INDIAN REGION.							AUSTRALIAN REGION.						
	Northern Europe.	Central Europe.	Southern Europe.	North Africa.	Asia Minor.	Palestine.	Persian Subregion.	Central Asia.	Siberian Subregion.	North-east Africa.	North-west Africa.	South-east Africa.	South-west Africa.	Madagascar.	India and Burmah.	China and Cochin China.	Malay Peninsula.	Sumatra.	Java.	Borneo.	Philippines.	Celebes.	Moluccan Group.	Papuan Group.	Timor Group.	Australia.	New Zealand.
Coracias abyssinicus †
— lorti
— caudatus
— spatulatus
— weigalli	*	*	*	*	*	*	*	*
— garrulus
— indicus †	.	*	*	*	*	*	*	*
— affinis
— naevius
— mosambicus
— cyanogaster
— temmincki
Eurystomus glaucurus
— afer
— gularis
— orientalis
— pacificus
— crassirostris
— salomonensis
— azureus
Brachypteracias leptosomus
— squamiger
Atelornis pittoides
— crossleyi
Leptosomus discolor
— gracilis

† Has been once recorded as a straggler to the British Isles.

FAMILY CORACIIDÆ.

SUBFAMILY CORACIINÆ.

GENUS CORACIAS.

Galgulus, Brisson, Orn. ii. p. 63 (1760). Type *C. garrulus*.

Coracias, Linn. Syst. Nat. i. p. 159 (1766). Type *C. garrulus*.

Coraciura, Bp. Consp. Volucr. Anis. p. 7 (1854). Type *C. cyanogaster*.

HAB. The Western Palæarctic Region, Western Siberia, Central Asia, the western part of the Indo-Malayan Region, and the Ethiopian Region.

Alis longis, latis, remige secundâ longissimâ: caudâ æquali seu rectricibus extimis utrinque elongatis: rostro validiusculo, conico, apice deflexo, hamato, longiore quam latiore: pedibus robustis, brevibus.

Bill nearly as long as the head, compressed, longer than it is broad, the tip decurved and slightly notched; gape-line nearly straight, the gape furnished with decurved bristles; nostrils basal, linear, partly concealed by feathers; a bare space behind the eye. Wings rather long and broad, the second quill longest. Tail rather long, nearly even, or with the external rectrices elongated. Feet short and stout, the tarsus covered in front with four larger and three inferior broad scutellæ; claws moderate arched, acute.—Type *Coracias garrulus*.

THE present genus contains twelve species, only one of which is a regular summer resident in the Western Palæarctic Region, and one other an occasional visitant. In their habits they are arboreal, uneasy and restless, and shy, except when they have not been subjected to persecution. They frequent woods, groves, gardens, and in some localities inhabited places. Their flight is strong and swift, and they have a habit of executing peculiar aerial evolutions when on the wing, and from this peculiarity their English and German name is derived. They feed on insects of various kinds, which they usually capture on the wing, but also take from the ground. They nest in hollow trees, banks, or in old ruins, occasionally even in inhabited houses, and deposit several pure white glossy eggs on the chips of wood at the bottom of a tree-hollow, or when nesting in old walls or banks they make a clumsy nest of roots, grass, straw, hair, &c. Five species, all of which inhabit the Ethiopian Region, have the external rectrices much elongated, while *Coracias garrulus* occasionally has these feathers elongated, though not very much, beyond the other tail-feathers.



ABYSSINIAN ROLLER.
CORACIAS ABYSSINICUS.

CORACIAS ABYSSINICUS.

ABYSSINIAN ROLLER.

- Le Rollier d'Abyssinie*, Montbeillard, Hist. Nat. Ois. iii. p. 143, Pl. Enl. 626 (1775); D'Aubenton, Pl. Enl. no. 626.
- ? *Le Rollier du Sénégal*, Montb. tom. cit. p. 143, Pl. Enl. 326 (1775); D'Aubent. Pl. Enl. no. 326.
- ? *Coracias leucocephalus*, P. L. S. Müller, Natursystem, Suppl. p. 86 (1776, ex Montbeill.).
- Abyssinian Roller*, Latham, Synopsis, i. p. 408, no. 2 (1781).
- ? *Senegal Roller*, id. tom. cit. p. 408, no. 3 (1781).
- Coracias abyssinus*, Bodd. Tabl. des Pl. Enl. p. 38 (1783).
- Coracias abyssinica*, Gmel. Syst. Nat. i. p. 379 (1788); Latham, Ind. Orn. Suppl. p. 169 (1790); Licht. Verz. Doubl. p. 20 (1823); Steph. in Shaw's Gen. Zool. xiv. p. 71 (1826); Swainson, B. of W. Afr. ii. p. 105 (1837); id. Classif. of B. ii. p. 333 (1837); Rüpp. Syst. Uebers. Vög. N.O.-Afr. p. 23 (1845); Des Murs, Voy. en Abyssinie, vi. p. 79 (1845-50); Strickl. P. Z. S. 1850, p. 216; Bp. Consp. Gen. Av. i. p. 167 (1850); Reichenb. Meropinæ, p. 46, pl. 431. fig. 3181 (1852); Schl. Contr. Orn. 1852, p. 124; Hartlaub, Journ. für Orn. 1853, p. 400; Lichtenstein, Nomencl. Av. p. 68 (1854); von Müller, Journ. für Orn. 1855, p. 6; A. E. Brehm, op. cit. 1855, pp. 486, 492; Heugl. Syst. Uebers. p. 17 (1856); Horsf. & Moore, Cat. B. Mus. E.I. Co. ii. p. 571 (1856); Hartl. Orn. Westafr. p. 30 (1857); Hartl. J. f. Orn. 1861, p. 104; Brehm, Reise Habesch, p. 210 (1863); Antinori, Cat. descr. Coll. Ucc. p. 26 (1864); id. Journ. f. Orn. 1866, p. 199; Heuglin, op. cit. 1868, p. 319; id. Orn. N.O.-Afr. i. p. 174 (1869); Blanford, Geol. & Zool. Abyss. p. 319 (1870); Finsch, Trans. Zool. Soc. vii. p. 220 (1870); Sharpe, Ibis, 1871, p. 197; Antinori & Salvadori, Viagg. dei Antinori, Beccari e Issel, Ucc. p. 62 (1873); Sharpe, P. Z. S. 1874, p. 306; Dresser & Blanford, Ibis, 1874, p. 337; Bocage, Journ. f. Orn. 1876, p. 435; Hartl. Abh. nat. Ver. Bremen, vii. p. 110 (1881); Salvad. Ann. Mus. Genov. (2) i. p. 115 (1884); Hartert, Journ. f. Orn. 1886, p. 592; Yerbury, Ibis, 1886, p. 15; Salvadori, Ann. Mus. Genov. (2) vi. p. 225 (1888).
- ? *Coracias senegalensis*, Gmel. Syst. Nat. i. p. 379 (1788); Reichenb. Meropinæ, p. 47, pl. 435. fig. 3188 (1852); Bp. Consp. Gen. Av. i. p. 167 (1850).
- ? *Coracias senegala*, Lath. Ind. Orn. p. 169 (1790); Daudin, Traité d'Orn. p. 261 (1800); Vieill. Nouv. Dict. xxix. p. 433 (1819).
- Coracias abyssinicus*, Gmel., Daudin, Traité d'Orn. p. 260 (1800); Lesson, Man. d'Orn. i. p. 399 (1828); Strickland, Proc. Zool. Soc. 1850, p. 216; Cabanis & Heine, Mus. Hein. i. p. 117 (1859-60); Hartmann, Journ. f. Orn. 1863, p. 319; Salvin, Cat. Strickl. Coll. p. 411 (1882); Sharpe, Cat. B. Brit. Mus. xvii. p. 19 (1892).
- The Swallow-tailed Indian Roller*, Edwards, Gleanings of Nat. Hist. pt. iii. p. 249, pl. 327 (1806).
- Le Rollier à longs brins d'Afrique*, Levaill. Hist. Nat. Roll. et Geais, no. 25 (1806).
- Coracias albifrons*, Shaw, Gen. Zool. viii. part 2, p. 392 (1809); Dumont, Dict. des Sci. Nat. xlv. p. 181 (1827).
- Galgulus caudatus*, Vieill. Nouv. Dict. xxix. p. 433 (1819, nec Linn.); id. Tabl. Encycl. et Méthod. ii. p. 868 (1823, nec Linn.).
- Coracias caudata* (nec Linn.), Wagler, Syst. Av., *Coracias*, no. 2 (1827); Gray, Gen. of B. i. p. 62 (1845); id. Cat. Fissir. Brit. Mus. p. 34 (1848).

Coracias habessinica (Gmel.), Hemp. & Ehrenb. Symb. Phys., Aves, fol. 3 (1829) ; Heugl. Orn. N.O.-Afr. i. p. 174 (1869) ; Dresser & Blanford, Ibis, 1874, p. 337.

Coraciura abyssinica (Gmel.), Bp. Conspect. Volucr. Anisodact. p. 7 (1854).

Coracias loquax, Licht. Nomencl. Av. p. 68 (1854).

Coracias abyssina (Gmel.), Schlegel, Mus. Pays-Bas, *Coraces*, p. 134 (1867).

Coracias (Coraciura) abyssinia, Gray, Hand-l. of B. i. p. 76 (1869).

Figuræ notabiles.

Edwards, Gleanings, iii. pl. 27 ; D'Aubenton, Pl. Enl. 326, 626 ; Reichenb. Merop. Taf. 431. fig. 3181 ; Levaillant, Hist. Nat. Roll. & Geais, pl. 25.

HAB. North-eastern and Western Africa from about 20° N. lat. down probably nearly to the Equator.

♂ *ad.* fronte, mento et striâ superciliari albidis : pileo, nuchâ, capitis lateribus et corpore subtùs viridi-cæruleis, pileo saturiore et corpore subtùs pallidior : gulâ argenteo-cyanco longitudinaliter striatâ : dorso cum scapularibus dilutè cinnamomeis : tectricibus alarum minoribus, uropygio et supracaudalibus ultramarinis : tectricibus majoribus viridi-cæruleis : remigibus ad basin pallidè viridi-cæruleis, versùs apicem saturatè ultramarinis, ad apicem et in pogonio interno nigro marginatis : rectricibus centralibus nigris, ultramarino tinctis, reliquis ad basin saturatè cæruleo, et versùs apicem pallidè cæruleis, duabus extimis valdè elongatis, attenuatis et nigro terminatis : rostro nigro : pedibus sordidè viridibus : iride fuscâ.

Adult male (Bogos, Abyssinia).—Forehead, chin, and a line extending over the eye greyish white ; crown, nape, sides of the head, throat, and underparts generally greenish turquoise-blue, duller and darker on the crown and nape, brighter on the throat and rather paler on the abdomen ; throat with streaks of silvery blue ; back and scapulars reddish cinnamon ; rump and upper tail-coverts rich ultramarine-blue ; least wing-coverts ultramarine-blue, the rest greenish blue ; quills pale turquoise-blue on the basal portion, and on the terminal portion deep ultramarine-blue, with the inner webs broadly margined with black and tipped with black ; central rectrices black, tinged with ultramarine, the rest dark blue at the base and pale blue on the terminal portion, with black shafts, the two external ones much elongated and attenuated, and black from where they attenuate to the tip : bill black ; feet dull greenish yellow ; iris brown. Total length about 17 inches, culmen 1·45, wing 6·8, tail 12·5, the outer rectrices extending 6 inches beyond the rest, tarsus 1.

Adult female (Kordofan).—Closely resembles the male, but has the external rectrices rather shorter.

Young.—Resembles the adult, but is duller in colour and the outer rectrices are not elongated.

THE Abyssinian Roller inhabits North Africa from about 20° N. lat. down to the equator, and is also found in Southern Arabia, where it was observed and recorded by Hemprich and Ehrenberg. When in Berlin I examined the collection formed by these gentlemen and observed that one specimen is marked as having been obtained in Egypt ; but von Heuglin records it as not occurring north of 20° N. lat., below which it is common and resident. Along the coast of the Red Sea between Suakim and Massowah, he remarks, it descends to nearly the sea-level ; whereas in

Abyssinia he found it tolerably high up in the mountains. I may here mention that Major Yerbury observed a Long-tailed Roller, probably the present species, at Haith-al-him, near Aden. Mr. Blanford writes (*l. c.*) that in Abyssinia "this bird is not rare locally on the highlands, but by no means generally distributed. I saw it occasionally between Dolo and Antalo and again, rather more commonly, about Lake Ashangi (8000 feet above the sea) and in some of the valleys further south, but not on the plateaux. It was very common in the subtropical region of the Anseba and Lebka, and I saw one or two birds in August in Samhar, near the coast." Antinori and Salvadori write that this Roller probably remains most of, if not all, the year in the Bogos territory, and Antinori remarks that it is the most widely distributed species in North Central Africa from 15° N. lat. down to the equator. Specimens killed in September, he adds, have the lateral tail-feathers longest.

On the west coast it has been met with from Senegambia down to the equator, and judging from the number of skins I have seen at the plume-dealers, all of which came from Senegal, it must be extremely common there. Hartert states (*l. c.*) that it was often seen from Keffi to Sokoto in the Niger district, and according to von Heuglin it is found in the Gaboon district. Finally, I may add that Dr. R. B. Sharpe records this Roller from Bulama, one of the Bissagos Islands off the west coast of Africa, having received a specimen in a small collection of Birds made there by Lieut. Bulger. Montbeillard figured a Roller (*l. c.*) from Senegal, under the name of *Le Rollier du Sénégal*, which several naturalists have considered to be a distinct species, inasmuch as in it the ferruginous coloration of the back commences immediately behind the nape instead of at the interscapular region; but since later research has failed to show that any such bird really inhabits Senegal, it seems to me highly probable that Montbeillard's plate was drawn from an aberrantly marked specimen of *Coracias abyssinicus*. That such a bird as that figured by Montbeillard did exist seems tolerably certain, as Edwards ('Gleanings of Nat. Hist.' pl. 327) figured one similarly marked, and states that it was shown to him by a "Mr. Page, gentleman to Lord Melbourne," who informed him that it was a native of the island of Ceylon—which was undoubtedly a mistake, as no such Roller occurs in Ceylon.

The present species has also been recorded as a rare straggler as far north even as the British Isles.

According to Dr. Bree, Mr. Small, a naturalist at Edinburgh, had in his possession a male Abyssinian Roller which was killed near Glasgow, a year or two previous to 1859; and he says that Mr. Small stated that the female was also obtained a short time after, about forty miles distant from where the male was killed. Dr. Bree suggested that possibly these two were birds escaped from confinement; but this is a bird I have never known to be held in captivity. According to Gray (B. of W. of Scotl. p. 203) the specimen is in the Paisley Museum, so at my request Mr. J. A. Harvie Brown went to Paisley, examined the specimen in question, and compared it with specimens of *Coracias abyssinicus* and *Coracias garrulus* which I sent to him for that purpose, and wrote to me as follows:—"There is not the remotest doubt attaching to the Abyssinian Roller now before me, and it is labelled 'Abyssinian Roller, *Coracias garrula*, shot at Crookston, near Paisley, Renfrewshire, and presented by Mr. Robert Small, taxidermist, Edinburgh.'" There appears therefore no doubt that the specimen in question is really referable to *Coracias abyssinicus* and is not, as I suggested to Mr. Harvie Brown, *Coracias garrulus* with the external rectrices slightly elongated, as does sometimes occur in what are probably very old birds of *C. garrulus*; but whence the bird in question came to Scotland, and how a strictly African species could have wandered so far from home, it is difficult to surmise.

In habits the Abyssinian Roller is stated to assimilate closely with its allies, and its cry is harsh and loud. Blanford says that its "habits are precisely similar to those of *Coracias indicus*. It is

frequently seen sitting on trees or bare stems and thence descending to the ground for insects, or catching them on the wing." Von Heuglin writes (*l. c.*) that it "inhabits the plains, as also wooded districts and localities far from wells and water. It is usually found in families and pairs, both on dry tree-tops and amongst the bushes. Not unfrequently it descends to the ground, or it captures insects, chiefly grasshoppers, on the wing. Usually it is by no means shy, is very lively, noisy, and quarrelsome, and is fond of attacking other birds."

According to Brehm, Vierthaler, and Antinori, this Roller deposits its eggs, which resemble those of *Coracias garrulus*, in hollow trees, and Antinori says that it has young in August. It is, however, said by Hemprich and Ehrenberg and von Heuglin to construct its nest, like a Crow or Magpie, on the branches of trees; but this is so contrary to the usual nesting-habits of the Rollers that they were certainly mistaken, and the nests in question cannot have been those of the Abyssinian Roller; besides which the eggs of all the Rollers are white, and not as described by them as follows:—"Ova virent, fragmenta vidi. Nidus in Ficu sycomoro ut Corvorum nostrorum laxius sociales e ramulis aridis facti, minores;" and von Heuglin states that he saw nests which clearly belonged to this Roller which resembled slightly constructed nests of the Magpie, and were placed on the tops of somewhat bare trees in the Steppes. Von Heuglin further says that "they pair in the rainy season, and the male then rises sometimes high up in the air and glides either in a straight line or else in serpentine flight, the tail being extended and closed alternately, and utters a quick and peculiar call-note."

As above stated, the food of this Roller consists of insects, chiefly grasshoppers, which it either picks up from off the ground or catches on the wing. The specimen figured is the male above described and is in my own collection.

In the preparation of the above article I have, besides the large series in the British Museum, examined the following specimens:—

E Mus. H. E. Dresser.

a, ♂ ad. Abyssinia (*Eyton coll.*). *b*, ♂ ad.; *c*, ♀ ad. Bogos, Abyssinia (*Gerrard*). *d*, ♀ ad. Kordofan, 16th March (*Petherick*). *e*, ♂ ad. Shoa, 1865 (*Bellenghi*). *f, g, h, i, j, k*, ♂ ad. Senegambia (*Ashmead*).

E Mus. H. B. Tristram.

a. Senegambia (*Boucard*). *b, c*. Senegambia (*Ashmead*).



J.G. Keulemans lith.

Hanhart imp.

PINK THROATED ROLLER.
CORACIAS, LORTI.

CORACIAS LORTI.

PINK-THROATED ROLLER.

Coracias caudata (nec Linn.), Salvad. Ann. Mus. Genov. (2) i. p. 115 (1884).

Coracias lorti, Shelley, Ibis, 1885, p. 399; Salvad. Ann. Mus. Genov. (2) vi. p. 224 (1888); Sharpe, Cat. B. Brit. Mus. xvii. p. 20 (1892).

Figura nulla.

HAB. East Africa (Somaliland and Shoa).

Ad. suprà sicut in *C. caudato* coloratus, sed pileo vix saturatiore: mento albido: gulâ lætè lilacinâ sicut in *C. caudato*, sed jugulo, pectore et corpore subtùs turcino-cæruleis: rostro nigro: pedibus griseis: iride fuscâ.

Adult male (Shoa, May 1).—Upper portions, wings, and tail as in *Coracias caudatus*, but the crown rather darker in tone of colour; chin dull white; upper throat vinous-lilac, this colour, however, not extending beyond the line of the end of the ear-coverts; lower throat and rest of the underparts turquoise-blue as in *Coracias abyssinicus*, but rather darker: bill black; legs grey; iris brown. Total length about 13 inches, culmen 1·35, wing 6·7, tail 7·2, the outermost rectrices extending 2·45 beyond the central ones, tarsus 1.

Young male (Shoa).—Differs from the adult in not having the outer tail-feathers elongated, and in being generally duller in colour; the throat is dull brownish vinous and the upper part of the breast is dull pale brownish tinged with blue, the rest of the underparts being much duller than in the adult.

THIS, one of the more recently discovered species of Roller, appears to intervene between *C. caudatus* and *C. abyssinicus*, its habitat, so far as we know, being in the southern portion of the range of the latter species, and far to the north of the range of *C. caudatus*. First discovered in Somaliland by Mr. Lort Phillips, who met with it on two or three occasions on the plateau, it has also been met with in Shoa by the Italian travellers Count August Bontourline and Dr. Leopold Traversi, and the two specimens obtained by these gentlemen are now in my collection.

In general appearance the present species is intermediate between *C. abyssinicus* and *C. caudatus*, and it will be interesting, when the country gets better explored, to ascertain how far its range extends, and especially how far south it occurs.

Respecting the habits and nidification of this Roller there is as yet nothing on record. The specimen figured is the type, for the loan of which I am indebted to Captain Shelley, in whose

collection (now acquired by the British Museum) it is ; and the adult specimen described, which agrees closely with the type, is the one in my own collection, where the young bird described also is.

Besides the type, I have examined the following specimens:—

E Mus. H. E. Dresser.

a, ♂ ad. Knolla, near Lake Zoquala, Shoa, December 1885 (*Dr. L. Traversi*). *b*, ♂ juv. Lake Zuai, Shoa, May 1886 (*Dr. L. Traversi*).





J.G. Keulemans lith.

LONGTAILED ROLLER
CORACIAS CAUDATUS.

CORACIAS CAUDATUS.

LONG-TAILED ROLLER.

Galgulus angolensis, Briss. Orn. ii. p. 72, pl. vii. fig. 1 (1760).

Coracias caudata, Linn. Syst. Nat. i. p. 160 (1766); P. L. S. Müller, Natursyst., Suppl. p. 184 (1776); Gmel. Syst. Nat. i. p. 380 (1788); Lath. Ind. Orn. i. p. 169 (1790); Daudin, Traité d'Orn. p. 260 (1800); Dumont, Dict. Sc. Nat. xvi. p. 181 (1827); Gray, Gen. of B. i. p. 61 (1845); Des Murs, Iconogr. Orn. pl. 28 (1846); Bp. Conspect. Gen. Av. i. p. 167 (1850); Strickland, Proc. Zool. Soc. 1850, p. 216; Reichenb. Meropinae, p. 47, pl. 432. fig. 3182 (1852); Sclater, Contrib. Orn. 1852, p. 124; Strickl. & Sc. tom. cit. p. 154; Hartlaub, Journ. f. Orn. 1853, p. 400; Lichtenstein, Nomencl. Av. p. 68 (1854); von Müller, Journ. f. Orn. 1855, p. 6; Hartl. Orn. Westafr. p. 30 (1857); Hartlaub, Journ. f. Orn. 1861, p. 104; Sclater, Proc. Zool. Soc. 1862, p. 12, 1864, p. 110; Kirk, Ibis, 1864, p. 324; Layard, B. of S. Afr. p. 61 (1867); Hartlaub, Proc. Zool. Soc. 1867, p. 824; Schlegel, Mus. Pays-Bas, *Coraces*, p. 135 (1867); Gurney, Ibis, 1868, p. 461; Heuglin, Journ. f. Orn. 1868, p. 318; Sharpe, Proc. Zool. Soc. 1869, p. 569; Cab. in Von der Decken's Reise, iii. p. 34 (1869); Layard, Ibis, 1869, p. 364; Heuglin, Orn. N.O.-Afr. i. p. 173 (1869); Finsch & Hartlaub, Vög. Ost-Afr. p. 154 (1870); Sharpe, Ibis, 1871, p. 194; Gurney in Andersson's B. of Damara L. p. 53 (1872); Sharpe, Proc. Zool. Soc. 1873, p. 712; T. E. Buckley, Ibis, 1874, p. 364; Bocage, Journ. Sc. Math., Phys. e Nat. Lisboa, v. pp. 35, 50 (1874); Sharpe in Layard's B. of S. Afr. p. 104 (1875); id. Journ. f. Orn. 1876, p. 406; Barratt, Ibis, 1876, p. 198; Fischer, J. f. Orn. 1877, p. 178; Bocage, Journ. Sc. Math., Phys. e Nat. Lisboa, vi. p. 144 (1877); Nicholson, Proc. Zool. Soc. 1878, p. 354; Cabanis, Journ. f. Orn. 1878, p. 234; Fischer, tom. cit. pp. 254, 287; id. J. f. Orn. 1879, p. 282; Ayres, Ibis, 1879, p. 290; Gurney, Ibis, 1881, p. 124; Shelley, Proc. Zool. Soc. 1881, p. 566; Bocage, Orn. d'Angola, p. 84 (1881); Sharpe in Oates' Matabele-Land, p. 302 (1881); Shelley, Ibis, 1882, p. 243; id. Proc. Zool. Soc. 1882, p. 302; Schalow, Journ. f. Orn. 1883, p. 348; Boehm, tom. cit. p. 170; Sharpe in Layard's B. of S. Afr., App. p. 805 (1884); Fischer, Zeitschr. i. p. 359 (1884); Boehm, Journ. f. Orn. 1885, p. 57; Fischer, tom. cit. p. 127; Ayres, Ibis, 1886, p. 284; Reichenow, Journ. f. Orn. 1887, p. 61; Matschie, tom. cit. p. 152; Ayres, Ibis, 1887, p. 50; Tristram, Ibis, 1889, p. 225; Emin, Journ. f. Orn. 1891, p. 59; Reichenow, tom. cit. p. 151.

Le Rollier d'Angola, Montbeill. Hist. Nat. Ois. iii. p. 144, Pl. Enl. 88 (1775).

Long-tailed Roller, Latham, Synopsis, i. p. 409 (1781).

Galgulus angolensis, Bodd. Tabl. Pl. Enl. p. 6 (1783, ex Montbeill.).

Coracias angolensis (Bodd.), Shaw, Gen. Zool. vii. pt. 2, p. 394 (1809); Steph. in Shaw's Gen. Zool. xiv. p. 70 (1826).

Galgulus caudatus (Linn.), Vieill. Tabl. Encycl. et Méthod. p. 868 (1823).

Coraciura caudata (Linn.), Bp. Consp. Volucr. Anisod. p. 7 (1854).

Coracias caudatus, Linn., Cabanis & Heine, Mus. Hein. ii. p. 116 (1859-60); Salvin, Cat. Strickl. Coll. p. 411 (1883); Sharpe, Cat. B. Brit. Mus. xvii. p. 21 (1892).

Coracias nævia (nec Daud.), Bianc. Spec. Zool. Mosamb. fasc. 14, p. 49 (1865).

Coracias abyssinica (nec Bodd.), Layard, B. of S. Afr. p. 60 (1867); Chapman, Trav. S. Afr. ii. App. p. 408 (1868).

Coracias (*Coraciura*) *caudata*, Linn., Gray, Hand-l. of B. i. p. 76, no. 904 (1869).

Le-cler-cler, Bechuanan; *Fee-fa*, Matabeli; *Kubianganga*, *Ambeta*, Angolan; *Mrututu*, *Pansi*, Zanzibari; *Ubion-ganga*, Quillingues; *Tacamantaca*, Ambriz; *Lukambo*, in Kikombo.

Figuræ notabiles.

Montbeillard, Pl. Enl. 88 ; Des Murs, Icon. Orn. pl. 28 ; Reichenbach, Meropinae, pl. 432. fig. 3182.

HAB. South Africa, from Angola on the west and Uzinzi and Ugogo on the east side down to Natal.

♂ *ad.* fronte et striâ supraoculari cum mento albidis, pileo et collo postico sordidè viridibus cæruleo tinctis : dorso, scapularibus et secundariis intimis sordidè fulvo-cinnamomeis viridi tinctis : uropygio, supracaudalibus et tectricibus alarum minoribus ultramarinis, supracaudalibus vix viridi lavatis, tectricibus alarum majoribus viridi-cyaneis : remigibus nigricantibus, in pogonio externo ultramarinis, basin versùs turcino-cæruleis : rectricibus centralibus fuliginoso-virentibus, reliquis thalassinis, basi ultramarinis, extimis utrinque valdè elongatis, apicibus attenuatis et nigris : regione paroticâ rufescenti-lilacinâ : jugulo et pectore lætè lilacinis albo-striatis : abdomine et subcaudalibus ultramarinis : rostro nigro : pedibus sordidè viridi-griseis : iride fuscâ.

♀ *ad.* mari similis, sed rectricibus lateralibus brevioribus.

Juv. coloribus sordidioribus : rectricibus lateralibus non elongatis : gulâ et gutture pallidè fusco-cervinis albido striatis et vinaceo tinctis.

Adult male (Zambesi).—Forehead and a line over the eye dull white; crown and nape dull bluish green; back, scapulars, and inner secondaries dull cinnamon-brown, tinged with green; rump, upper tail-coverts, and lesser wing-coverts rich ultramarine-blue, the upper tail-coverts tinged with green; larger wing-coverts bluish green; quills black on the terminal portion, the outer webs ultramarine-blue, the basal portion of the quills pale blue and greenish blue; central rectrices blackish, tinged with green, the rest blue with a greenish tinge, the outermost rectrix on each side much paler than the rest, the terminal portion elongated, attenuated, and black in colour; chin whitish; sides of the head below the eye, throat, and breast rich vinous lilac, the throat striped with white; abdomen and under tail-coverts turquoise-blue: bill black; legs greenish grey; iris brown. Total length about 13 inches, culmen 1.25, wing 6.5, tail 7.7, tarsus 0.95, outermost tail-feathers extending 3 inches beyond the rest.

Adult female (Zambesi).—Resembles the male; according to Ayres the female has the iris tawny umber, whereas in the male it is light umber, and the lateral rectrices are shorter than in the male.

Young (Magaliesberg, Transvaal).—Much duller in general coloration than the adult; lateral rectrices not elongated; throat and breast pale buffy brown, with dull white stripes and slightly tinged in places with vinous pink.

Obs.—According to Sir J. Kirk, the plumage varies considerably at different seasons of the year, being much less brilliant during the cold and dry seasons.

THE Long-tailed Roller appears to take the place south of the equator which its congener *Coracias abyssinicus* does north of that line. How far north it ranges in Western Africa I cannot with certainty say; but according to Professor Barboza du Bocage (*l. c.*) it is common throughout the vast territory of Angola, and has been sent from Ambaca, Quillingues, Huille, Gambos, and Humbe by Anchieta, and it was met with by Monteiro on the Ambriz. According to Andersson it is “common

in the Lake-regions, and is also pretty common in Damaraland, where, however, I imagine that it must be partially migratory, as during the dry season comparatively few individuals are seen. It is more shy and difficult of approach than *Coracias pilosus*, which it otherwise resembles as to food and habits." To this Mr. J. H. Gurney adds that Layard's note as to the occurrence of *Coracias abyssinicus* in Namaqualand is not borne out by Andersson's MSS., and there can be little doubt that the bird obtained was really *Coracias caudatus*.

On the eastern side of the African continent it was obtained by Speke in the interior at Uzinzi and Uzaramo, near the junction of the Kurgeh and Mgeta rivers; and Emin Pasha has recently sent specimens from Ussagara, Tubúguë, Mpapwa, and Tura, Uniamuesi. Von Heuglin saw a Roller in the lowlands south-west of the Gazelle river which he believed to be this species; but he did not obtain it, and it seems to me that it was in all probability *Coracias lorti* and certainly not *C. caudatus*.

It has been recorded from Dar-es-Salaam, Pagani, Usambara Mountains, and various other parts of the Zanzibar country. Sir John Kirk says that it is very common in the open woods and bush-country near the Zambesi. Verreaux records it as having been obtained at Kurrichane. Mr. R. Moffat, jun., obtained it in the Kuruman country; it has been sent by Fornasini from South Mozambique. Ayres procured it at Buffalo Kraal in the Transvaal in May 1885, and states that it is plentiful throughout the Transvaal, Matabeli, and Mashona countries. Oates met with it between the Pantamalenka river and the Zambesi; and according to Ayres it is fairly plentiful on the upper portions of the Limpopo river above Vlei Poort, and also occurs in Natal. In the interior Boehm thinks that he saw it on the west shore of the Tanganyika, but that further west it is replaced by *Coracias spatulatus*; and according to Pruen (*fide* Tristram, *l. c.*) it is found at Kikombo in Central Africa.

In its habits the present species is said to resemble *Coracias garrulus*, but it is extremely wild and shy. It inhabits wooded localities, affecting hilly districts, and apparently preferring some hillsides to others, and high trees to low bushes, but Sir John Kirk met with it on the Zambesi in open woods and the bush-country near rivers. Dr. Fischer states that it affects sparsely wooded districts, where it perches on a dead tree or tree-stump on the watch for insects, which it catches on the wing, or else picks up from the ground, and large grasshoppers are a favourite food with it. Dr. Boehm says (*l. c.*) that he met with it "chiefly on singly standing cocoa-palms, and is there so shy that I could not kill one; as soon as the bird observes anyone that appears to him to be suspicious he flies off uttering a loud scolding note, and takes refuge in the denser parts of the Schamba. Like the other Rollers, this bird is of an uneasy and quarrelsome temperament and frequently attacks other birds. I observed it attack *M. forskali*, uttering at the same time a loud chattering cry. At Muin-Sagare it was common, and not rare around Kakuma."

Mr. Barratt, who remarks on its shyness, writes:—"The first specimen I shot was flying from tree to tree, uttering a harsh note and throwing its head about in perfect confidence. On my wounding it and attempting to pick it up, it screamed and furiously attacked my hand. I have often chased one for hours unsuccessfully, sometimes having to cross water up to my waist, so shy and wary are these birds. They generally frequent large trees near running brooks." Mr. T. E. Buckley also remarks that this Roller is extremely shy and it was difficult to procure specimens. Just before the breeding-season they fly high up in the air, rolling about from side to side, and uttering a harsh note all the time, settling afterwards on the very top of the nearest high tree. In the Matabeli country this is a royal bird, and no one except the king is allowed to wear its feathers. In confirmation of this Dr. Exton writes ('Ibis,' 1869, p. 364):—"From Sechele's northwards *C. caudatus* is commonly known as 'Mozilikatzé's bird,' its liveliness and pugnacity having perhaps given rise to

the old warrior's interest in it. In his earlier career Mozilikatzé claimed its feathers solely for royal use and adornment, and in his milder moods has been known to give an ox to the youth who had captured and presented one of these birds. It delights to perch on the topmost branch of a leafless tree, from which it gives forth its note of challenge; and should a Crow or Hawk approach, it will make rapid darts at the intruder, and with sharp pecks and harsh screams drive off birds greatly its superior in size and strength." Mr. J. H. Gurney says that the late Mr. E. C. Buxton, who met with this Roller near the Lo Bombo mountains in August 1872, wrote to him respecting it that he found the easiest way to procure these birds was to set the grass on fire: as soon as there was a large fire (and sometimes many acres would be burning at once) these birds came in numbers to feed on the insects that were driven out; and in fact all insectivorous birds came, to say nothing of Crows and others. It is said to have a habit, when disturbed by the solitary hunter, of flying directly towards him, high overhead, and after careful scrutiny wheeling off uttering discordant screams. In most parts of its range it appears to be a partial migrant, as Boehm remarks that in Central Africa this and other Rollers had almost all left in the first half of September, but returned at the commencement of the rainy season.

The food of this Roller consists of insects of various sorts—beetles, grasshoppers, locusts, &c., which it either catches on the wing or picks up from off the ground; and Mr. Ayres remarks that when the grass is burned in suitable localities he has observed as many as a dozen or more together following the course of the fire, settling on trees and bushes in front of the flames and pouncing down on beetles and grasshoppers that are driven out by the heat.

Like its congeners this Roller nests in the holes of old trees, depositing its pure white eggs on the rotten wood at the bottom of the hole. Fischer found the nest at Kipini (East Africa) on the 19th July, in the hollow branch of a *Hyphaena*, containing three eggs, and Mr. T. E. Buckley saw the young birds in the Transvaal in about November, evidently not long out of the nest. I have never been able to procure the eggs of this species, but they probably closely resemble those of the Common Roller.

The specimens figured and described are in my own collection, excepting the young bird from Magaliesberg, which is in the British Museum.

In the preparation of the above article I have, besides the series in the British Museum, examined the following specimens:—

E Mus. H. E. Dresser.

a, ♂ ad. Zambesi (*Bradshaw*). *b*, *c*, *d*, ad. Zambesi (*Cooke*).

E Mus. H. B. Tristram.

a. Mozambique (*H. Piers, R.N.*). *b*, ♂. Kikombo, C. Africa, 1888 (*S. T. Pruett*).



J.G. Keulemans lith.

RAQUETTAILED ROLLER.
CORACIAS SPATULATUS.



J. G. Keulemans del. et lith.

CORACIAS SPATULATUS.
(TYPE.)

Mintern Bros. imp.

CORACIAS SPATULATUS.

RACQUET-TAILED ROLLER.

Coracias spatulatus, Trimen, P. Z. S. 1880, p. 31; Reichenow & Schalow, J. f. O. 1880, p. 316; Bocage, Orn.

Angola, p. 536 (1881); Shelley, Ibis, 1882, p. 243; Sharpe, Cat. B. Brit. Mus. xvii. p. 22 (1892).

Coracias dispar, Bocage, Jorn. Sc. Lisb. xxviii. pp. 227, 232 (1880); Reichenow & Schalow, J. f. O. 1880, p. 316.

Coracias caudata (nec Linn.), Sharpe in Oates' Matabele-Land, App. *Birds*, p. 302 (1881).

Coracias sp., Boehm, J. f. O. 1883, p. 170.

Coracias spatulata, Trimen, Schalow, J. f. O. 1883, p. 348; Sharpe in Layard's B. of S. Afr., App. p. 805 (1884);

Reichenow, J. f. O. 1889, p. 276; Emin, J. f. O. 1891, p. 59; Reichenow, tom. cit. pp. 151, 209.

Hóbia, Benguelan (*fide* Anchieta).

Figura adhuc nulla.

HAB. Central Africa from Kakoma and Lake Taganyika down to Matabeleland on the east side, and Benguela and Angola on the west side of the Continent.

♂ *ad.* fronte et lineâ superciliari albidis: pileo, nuchâ et dorso anteriore sordidè viridibus, pileo cæruleo lavato: dorso reliquo, scapularibus et tectricibus alarum centralibus rufescenti-cervinis: alis sicut in *C. caudato* coloratis: rectricibus duabus centralibus nigro-cæruleis, duabus sequentibus utrinque saturatè ultramarinis, reliquis conspicuè nigro-cæruleo terminatis: rectricibus lateralibus valdè elongatis et conspicuè spatulatis: corpore subtùs pallidè turcino-cæruleo: rostro nigro: pedibus viridi-fuscis: iride fuscâ.

♀ mari similis.

Juv. coloribus sordidioribus: gulâ et gutture pallidè fusco-cervino lavatis: rectricibus lateralibus non elongatis sed indistinctè spatulatis.

Adult male (Umvuli river, 2nd August).—Forehead and a line extending over the eye dull white; crown, nape, and upper parts of the back dull light greenish, on the crown tinged with blue; rest of the back, scapulars, innermost secondaries, and central wing-coverts warm pale cinnamon-buff; primaries and secondaries black on the inner webs and ultramarine-blue on the outer webs, the basal portion of the primaries and secondaries pale bright turquoise-blue; the two central rectrices blackish blue, the next two on each side deep blue, the rest broadly and diagonally tipped with blackish blue, the outermost rectrix on each side much elongated and conspicuously spatulated; entire underparts pale turquoise-blue as in *Coracias abyssinicus*, but rather paler: bill black; iris brown; legs pale greenish brown. Total length about 15 inches, culmen 1.2, wing 6.5, tail 8.3, tarsus 0.95, lateral rectrices extending 3.4 beyond the central ones.

Adult female.—Resembles the male.

Young (*fide* Schalow, J. f. O. 1883, p. 349).—Resembles the adult, but the back, uropygium, tail, underparts, and scapulars are duller in colour, and the characteristic spatulation of the outer rectrices is wanting.

Young (N. of Pantanatenka).—Much duller than the adult in coloration; throat and breast washed with pale buffy brown, much like the young of *Coracias caudatus*; lateral tail-feathers not elongated, but showing a trace of spatulation.

Obs.—The plumage varies considerably in brilliancy according to the season of the year. According to Boehm the iris is brown, whereas Bradshaw says that it is yellowish brown, and Anchieta clear grey; the latter also says that the legs and feet are dull greenish, whereas Boehm says that they are greenish brown, and Jameson and Bradshaw greenish yellow. The young bird above described at the first glance much resembles the young of *Coracias caudatus*, but it has the tail with the central feathers very much darker and the next in succession with the dark tips as in the adult bird.

THE present species was first discovered by Dr. Bradshaw in the Zambesi country, and is at present known to occur on the east side of the African continent from Kakoma and Lake Tanganyika down to the Zambesi country, and on the western side in Benguela. Dr. Bradshaw observed it only on two occasions far from the Zambesi river, when he found it at a distance of about eighty miles to the south. He obtained the type specimen on the western boundary of the Leshumo valley, through the whole length of which water only runs during heavy rains; and Jameson, who obtained specimens on the Umvuli river in August, says that he did not meet with it in any other locality. Boehm met with it in Equatorial Africa at Kakoma (5° 47' S. lat.), and Emin Pasha sent home specimens from Uniamuesi near Ugogo. On the western side of the continent it has been obtained by Anchieta at Caconda in the interior of Benguela, and there are, according to Dr. Schalow, specimens in the Berlin Museum obtained by von Mechow at Malanga in Angola.

In habits, Dr. Boehm writes, this species “closely resembles its congeners. In pairs or else singly they wander through the forest and plain, and it is one of the birds one is pretty sure to meet with in the interior of the forest. Like its congeners its note is a sharp chatter, but besides this it sometimes utters the most various sounds, which are at times quite diabolical. I have heard a pair uttering a note like that of a clucking hen, ‘*duk, duk, dak, dāk,*’ followed by a note ‘*à-à-à.*’”

Anchieta remarks that in Benguela it inhabits shrubby places near water; but Dr. Bradshaw says that in the Zambesi country it “chiefly frequents the so-called ‘Sand-veldt,’ a tract of heavy sand-ridges, keeping about the tallest timber. In the winter months it makes its appearance in small companies of from four to ten or a dozen, but is out of plumage and very scarce during the rainy season, viz. from November to April. In flight and action these birds resemble the other Rollers, and are usually difficult to approach. They have a most peculiar harsh cry, which differs from that of the other species, and when once heard is easily recognized on repetition.” Jameson writes that Ronksly observed a party of them one day which were chasing each other about uttering loud harsh cries, some of the notes much resembling the yelping of puppies.

Nothing has as yet been recorded respecting the nidification of this Roller, and its eggs are

unknown. Boehm says that two young birds, which he believes were of this species, were brought to him on the 16th November, but unfortunately he could not preserve them.

Like its congeners it feeds on insects of various kinds, chiefly grasshoppers and coleoptera.

On the first Plate I have given a figure of the type, for the loan of which I am indebted to Mr. Trimen, the Curator of the South African Museum, Cape Town, who most courteously obtained permission and forwarded it to me to examine and figure; and on the second Plate I have figured the specimen from the Shelley collection, obtained by Jameson on the Umvuli river in August 1880. The type, a male, was obtained by Bradshaw on the western boundary of the Leshumo valley, Zambesi, on the 23rd May, 1878. Besides these two specimens and the three examples in the British Museum from the Pantanatenka river, Matabeleland, Ugogo, and Benguela, I have examined the following specimens:—

E Mus. Jameson.

a, b. Umvuli river, August 1880 (*Jameson*).



J.G. Keulemans del. et lith.

WEIGALLS ROLLER.
CORACIAS WEIGALLI.

Mintern Bros. imp.

CORACIAS WEIGALLI.

WEIGALL'S ROLLER.

Coracias spatulata (nec Trimen), Tristram, Ibis, 1888, p. 266.

Coracias weigalli, Dresser, Ann. & Mag. Nat. Hist. (6) vi. p. 351 (1890).

Coracias spatulatus (partim), Sharpe, Cat. B. Brit. Mus. xvii. p. 22 (1892).

Figura nulla.

HAB. Newala, East Africa.

Ad. pileo et nuchâ cum dorso antico sordidè olivaceis : fronte, mento et superciliis albis : dorso postico, scapularibus et secundariis intimis dilutè cinnamomeis : alis et caudâ sicut in *C. spatulato* coloratis : capitis lateribus, gulâ et pectore toto pallidè fusco-cervinis, conspicuè albo striatis et indistinctè vinaceo tinctis : abdomine imo, subcaudalibus et subalaribus pallidè turcino-cæruleis : rectricibus extimis valdè elongatis et spatulatis.

Adult (Newala, S. Africa).—Forehead, chin, and a board line above and behind the eye white ; crown, nape, and fore part of the back dull greenish ; rest of the back, scapulars, innermost secondaries, and median wing-coverts rich pale cinnamon ; quills turquoise-blue at the base, otherwise rich ultramarine-blue on the outer webs and black on the inner webs ; wing-coverts, except the broad median cinnamon band, ultramarine-blue ; rump and upper tail-coverts ultramarine-blue ; central tail-feathers black, washed with blue at the base, the rest broadly and diagonally terminated with black and blue, the outermost rectrix on each side much elongated and spatulated ; sides of the head, entire throat, and breast pale brownish buff, with conspicuous white shaft-stripes, and faintly washed with pinkish ; lower abdomen, under tail-coverts, and under wing-coverts pale turquoise-blue. Total length about 13 inches, culmen 1·25, wing 6·3, tail 8·3, tarsus 0·78, outer rectrices extending 3·5 inches beyond the central ones.

THIS Roller is as yet only known from Newala in East Africa, a station between the coast and Lake Nyassa, lat. 11° S., fifteen miles north of the Rovuma river, whence the type, the only specimen which has, as yet, been obtained, was sent with a small collection of skins by the Rev. Spencer Weigall, B.A., to Canon Tristram, who has kindly permitted me to describe and figure it.

Dr. Sharpe (*l. c.*) doubts the specific distinctness of the present bird, and considers it to be an immature individual of *C. spatulatus* ; but this I cannot in any way admit, for it exhibits no sign of immaturity in plumage, but, on the other hand, appears to be not only an adult but an old bird.

Besides, the external rectrices, which in immature examples are always either short or only extend but little beyond the other tail-feathers, are in the specimen in question very fully developed, and even longer than in the most adult *C. spatulatus* I have examined. The striping also extends, not, as in the young of *C. spatulatus*, on the sides of the neck only and on the breast, but over the entire throat, sides of the head, and breast, and is different in character from that in young *C. spatulatus*, and none of these feathers show any sign of change, the bird being very clean-moulted in plumage. These differences can be seen in the Plate of the present species and that of the type of *C. spatulatus*, which retains the immature plumage on the neck and breast. I should not have described this bird as specifically distinct from *C. spatulatus* were I not fully convinced that when more specimens arrive from that part of East Africa my views will be confirmed.

Compared with the adult male of *Coracias spatulatus* from the Umvuli river, above described, the type of *C. weigalli* has the wings rather brighter in colour, the upper parts somewhat darker in tinge, the white over the eye rather more extended, and the elongated tail-feathers are longer.

I forwarded copies of my three Plates of the Racquet-tailed Rollers to Dr. Reichenow at Berlin, asking him to compare them with the specimens in the Berlin Museum. It appears that they have no example of *C. weigalli*, but have, he writes, "adult specimens of *C. spatulatus* from Uniamuesi, Usegua, and Kakoma (East Africa), which agree with the plate, but the upper edge of the wing is not violet as there shown, all the smaller coverts and those on the upper edge of the wing being ultramarine-blue; the central and larger coverts are, however, reddish brown with a violet tinge, the foremost larger coverts having a blue tinge there as shown in the plate of *C. spatulatus*, type; the central tail-feathers are not bluish black, but dull black with a greenish tinge. We have also a specimen from Angola which agrees with the plate of *C. spatulatus*, type, but the external rectrices are not elongated; and a second specimen from Angola, which has the external rectrices elongated and has still a few feathers on the sides of the breast buff ('pallide cervinis et dilute cæruleo striatis'). This latter bird must therefore be the older of the two."

The specimen of *Coracias weigalli* figured and described is the type, for the loan of which I am indebted to my friend the Rev. Canon Tristram.



J.G. Keulemans. lith.

COMMON ROLLER.
CORACIAS GARRULUS.

Hanhart imp.

CORACIAS GARRULUS.

COMMON ROLLER.

Galgulus, Briss. Orn. ii. p. 65, pl. v. fig. 2 (1760).

Coracias garrula, Linn. Syst. Nat. i. p. 159 (1766); P. L. S. Müller, Natursyst. ii. p. 182 (1773); Gmel. Syst. Nat. i. p. 378 (1788); Lath. Ind. Orn. i. p. 168 (1790); Bechst. Gemeinn. Naturg. Deutschl. ii. p. 472 (1791); Beseke, Vög. Kurl. p. 33 (1792); Daudin, Traité d'Orn. p. 257 (1800); Bechst. Orn. Taschenb. i. p. 96 (1802); id. Gemeinn. Naturg. Deutschl. i. p. 282 (1805); Gmel. Gemeinn. Naturg. p. 69 (1806); Shaw, Gen. Zool. vii. part ii. p. 388 (1809); Meyer & Wolf, Taschenb. deutsch. Vögelk. i. p. 106 (1810); Pall. Zoogr. Ross.-As. i. p. 441 (1811); Meissner, Vög. d. Schweiz, p. 61 (1815); Meyer, Vög. Liv- u. Esth. p. 50 (1815); Temm. Man. d'Orn. p. 78 (1815); id. ibid. 2nd ed. i. p. 127 (1820); Koch, Baier. Zool. i. p. 86 (1816); Naumann, Vög. Deutschl. ii. p. 168, Taf. 60 (1822); C. L. Brehm, Lehrbuch, i. p. 112 (1823); Licht. in Eversm. Reise, p. 127 (1823); Steph. in Shaw's Gen. Zool. xiv. p. 70 (1826); Wagler, Syst. Av., *Coraces*, no. 1 (1827); Neumann, Uebers. Lausitz. Vög. p. 33 (1828); Less. Man. d'Orn. i. p. 399 (1828); Flem. Brit. Anim. p. 88 (1828); Lesson, Traité d'Orn. p. 354 (1831); C. L. Brehm, Vög. Deutschl. p. 160 (1831); Gloger, Schlesiens Wirbelth. p. 39 (1833); Williamson, P. Z. S. 1833, p. 88; Swagers, Ois. d'Eur. part vii. (1833); Gould, P. Z. S. 1834, p. 51; Landbeck, Vög. Würtemb. p. 17 (1834); Gloger, Naturg. Vög. Eur. p. 433 (1834); Jenyns, Man. Brit. Verteb. p. 156 (1835); Eyton, Cat. Brit. B. p. 25 (1836); Gould, B. of. Eur. ii. pl. 60 (1837); Hornsch. & Schilling, Verz. Vög. Pomm. p. 11 (1837); Dickson & Ross, P. Z. S. 1839, p. 119; Nordm. in Démidoff's Voy. Russ. Mérid. iii. p. 205 (1840); Zwadzki, Faun. galiz.-bukow. Wirbelth. p. 87 (1840); Macgilliv. Brit. B. iii. p. 540 (1840); Crespon, Orn. Gard, p. 75 (1840); Keys. & Blas. Wirbelth. Eur. p. 150 (1840); Benoit, Orn. Sicil. p. 25 (1840); Selys-Longch. Faune Belge, p. 107 (1842); Malh. Faun. Orn. Sic. p. 137 (1843); Schlegel, Rev. Crit. p. lvi (1844); Mühle, Orn. Griechenl. p. 33 (1844); Gray, Gen. of B. i. p. 62 (1845); Rüpp. Syst. Uebers. p. 23 (1845); Gray, List Fissir. Brit. Mus. p. 33 (1848); Blyth, Cat. of B. Mus. As. Soc. p. 51 (1849); Bp. Consp. Gen. Av. p. 167 (1850); J. E. Gray, Cat. Brit. B. p. 40 (1850); Erhard, Faun. d. Cykladen, p. 51 (1851); Palliardi, Syst. Uebers. Vög. Boehm. p. 20 (1852); Kjærb. Orn. Dan. pl. 13. fig. 4 (1852); Reichenb. Meropinae, p. 45, pl. 431. figs. 3179-80 (1852); Bailly, Orn. de la Savoie, i. p. 68 (1853); Brehm, Journ. f. Orn. 1854, p. 454; Bolle, op. cit. p. 452; Licht. Nomencl. Av. p. 68 (1854); Radde, Journ. f. Orn. 1854, p. 62; Bp. Consp. Volucr. Anisod. p. 7 (1854); Schlegel, Vog. Nederl. p. 261 (1854-58); Hewits. Eggs Brit. B. i. p. 253, pl. 64. fig. 3 (1856); Sundevall, Svenska Fogl. p. 158, pl. xxi. fig. 3 (1856); v. Müller, Journ. f. Orn. 1855, p. 6; C. Vangerow, op. cit. p. 185; Hartlaub, op. cit. p. 318; A. E. Brehm, op. cit. p. 373; Pässler, Journ. f. Orn. 1856, p. 42; Heugl. Syst. Uebers. Vög. N.O.-Afr. p. 17 (1856); Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 570 (1856); Jard. Edinb. N. Phil. Journ. new ser. iii. p. 242 (1856); Hartl. Orn. Westafr. p. 29 (1857); Bolle, Journ. f. Orn. 1857, p. 277; Loche, Cat. Prod. d'Algérie, p. 89 (1858); Finsch, Journ. f. Orn. 1859, p. 381; Artzibascheff, Excurs. Orn. Sárpa, p. 65 (1859); Leith Adams, Proc. Zool. Soc. 1859, p. 172; Tristram, Ibis, 1859, p. 27; Salvin, Ibis, 1859, p. 302; Heuglin, Ibis, 1859, p. 339; Seidensacher, Journ. f. Orn. 1860, pp. 313, 317; Lilford, Ibis, 1860, p. 235; Cab. & Hein. Mus. Hein. ii. p. 117 (1860); Hartl. Journ. f. Orn. 1861, p. 104; Jerdon, B. of India, i. p. 218 (1862); Gray, List Brit. B. p. 35 (1863); Tristram, Proc. Zool. Soc. 1864, p. 432; Wright, Ibis, 1864, p. 73;

Sperling, Ibis, 1864, p. 345; Salvadori, Journ. f. Orn. 1865, p. 130; De Filippi, Viagg. Pers. p. 346 (1865); More, Ibis, 1865, p. 131; Gould, B. Gt. Brit. ii. pl. 11 (1866); Tristram, Ibis, 1866, p. 81; Blyth, tom. cit. p. 345; Tyrwhitt Drake, Ibis, 1867, p. 425; Layard, B. of S. Afr. p. 60 (1867); Finsch, J. f. O. 1867, p. 237; Loche, Expl. Sci. Algér., Ois. ii. p. 88 (1867); Degl. & Gerbe, Orn. Eur. i. p. 169 (1867); Schlegel, Mus. Pays-Bas, *Coraces*, p. 133 (1867); Smith, Ibis, 1868, p. 449; Collett, Norges Fugle, p. 34 (1868); Heugl. J. f. O. 1868, p. 321; id. Orn. N.O.-Afr. i. p. 171 (1869); Gray, Hand-l. of B. i. p. 75, no. 897 (1869); Borggreve, Vogelf. Norddeutshl. p. 69 (1869); Doderl. Avif. Sicil. p. 54 (1869); A. von Homeyer, J. f. O. 1870, p. 218; Fritsch, Wirbelth. Boehm. p. 48 (1870); id. Vög. Eur. p. 89 (1870); Finsch & Hartl. Vög. Ost-Afr. p. 152 (1870); Elwes & Buckley, Ibis, 1870, p. 189; Sharpe & Dresser, B. of Eur. v. p. 141, pl. 293 (1871); Fritsch, J. f. O. 1871, p. 188; Goebel, tom. cit. p. 134; Borggreve, tom. cit. p. 212; Shelley, Ibis, 1871, p. 48; Saunders, tom. cit. p. 66; J. H. Gurney, tom. cit. p. 76; Sharpe, tom. cit. p. 189; Salvadori, Faun. Ital., Ucc. p. 43 (1871); R. Gray, B. of W. of Scotl. p. 202 (1871); Harting, Handb. Brit. B. p. 34 (1872); G. F. L. Marshall, Ibis, 1872, p. 205; Murie, tom. cit. p. 396; Collett, Orn. N. Norw. p. 37 (1872); Severtzoff, Turk. Jevot. p. 68 (1873); Shelley, B. of Egypt, p. 168 (1872); Andersson, B. of Damara Land, p. 56 (1872); Hume, Nests & Eggs of Ind. B. p. 104 (1873); Hume, Stray Feathers, i. p. 168 (1873); Hume, Lahore to Yarkand, p. 177 (1873); Sharpe, Proc. Zool. Soc. 1873, p. 712; Holtz, Journ. f. Orn. 1873, p. 143; Blyth, Ibis, 1873, p. 80; A. B. Brooke, tom. cit. p. 236; Ayres, Ibis, 1874, p. 102; Sharpe in Layard's B. of S. Afr. p. 102 (1875); Fallon, Ois. de la Belg. p. 28 (1875); Collin, Skand. Fugle, p. 134 (1875-77); Krüper, Journ. f. Orn. 1875, p. 277; Irby, Orn. Str. Gibr. p. 65 (1875); Shelley, Ibis, 1875, p. 68; Danford & Harvie Brown, tom. cit. p. 300; Irby, B. Gibr. p. 65 (1875); Blanford, East. Persia, ii. p. 125 (1876); Schalow, Journ. f. Orn. 1876, pp. 118, 176; Tschusi Schmidhofen, tom. cit. p. 331; Saunders, Bull. Soc. Zool. Fr. i. p. 326 (1876); Barratt, Ibis, 1876, p. 198; Dresser, tom. cit. p. 319; Ayres, tom. cit. p. 425; Hartl. Vög. Madag. p. 66 (1877); Finsch, Ibis, 1877, p. 52; Tschusi Schmidhofen, Vög. Salzb. p. 23 (1877); Sinternis, J. f. O. 1877, p. 65; Blasius, tom. cit. p. 317; Taczanowski, Bull. Soc. Zool. Fr. ii. p. 138 (1877); Danford, Ibis, 1878, p. 7; Hume, Str. Feath. vii. p. 181 (1878); Bocage, Journ. Lisb. vii. p. 134 (1879); Finsch, Reise nach Sib. p. 41 (1879); Bogdan. B. Cauc. p. 114 (1879); Finsch, Verh. z.-b. Ges. Wien, xxix. p. 153 (1879); Butler, Cat. B. Sind &c. p. 16 (1879); Rudolf v. Oesterr. J. f. O. 1879, pp. 51, 115; Goeldlin, tom. cit. p. 373; Brandt, J. f. O. 1880, p. 230; Bocage, Orn. Ang. p. 536 (1881); Sharpe in Oates' Matabele Land, App. p. 302 (1881); Shelley, P. Z. S. 1881, p. 566; Schalow, J. f. O. 1881, p. 307; Marschall & Pelzeln, Orn. Vindob. p. 35 (1882); Seebohm, Ibis, 1883, p. 21; Sharpe in Layard's B. S. Afr., App. p. 805 (1884); Eagle Clarke, Ibis, 1884, p. 144; Tristram, Faun. & Flor. Palest. p. 88 (1884); Seebohm, Hist. Brit. B. p. 327 (1884); Radde, Orn. Cauc. p. 319 (1884); Murray, Vertebr. Faun. Sind, p. 109 (1884); Fischer, J. f. O. 1885, p. 127; Krüper, tom. cit. p. 279; Zarudny, Ois. Transcasp. p. 48 (1885); Yerbury, Ibis, 1886, p. 15; Sharpe, tom. cit. pp. 488, 498; Giglioli, Avif. Ital. p. 214 (1886); Pleske, Vög. Kola-Halbinsel, p. 167 (1886); Radde, Faun. u. Flor. des südwestl. Caspi-Gebietes, p. 21 (1886); Salvad. Elenc. Ucc. Ital. p. 74 (1887); Tait, Ibis, 1887, p. 305; Symonds, t. c. p. 327; Koenig, J. f. O. 1888, p. 167; Radde & Walter, Vög. Transcasp. p. 79 (1888); Gigl. Avif. Ital. 1st Res. p. 352 (1889); Sir O. St. John, Ibis, 1889, p. 157; Lilford, tom. cit. p. 331; Meade-Waldo, tom. cit. p. 515; Oates in Hume's Nests & Eggs Ind. B. iii. p. 56 (1890); Schalow, J. f. O. 1890, p. 24; Koenig, tom. cit. p. 310; Lilford, Col. Fig. B. Brit. Isl. part xii. (1890); Zarudny, Recher. Zool. Transcasp. p. 53 (1890); Sharpe, P. Z. S. 1890, p. 549; id. Ibis, 1891, p. 110; Evans, t. c. p. 65; Saunders, tom. cit. p. 178; Seebohm, Ibis, 1892, p. 20; Lloyd Patterson, tom. cit. p. 181; Rendall, tom. cit. p. 223; Hartert, tom. cit. p. 505.

The Garrulous Roller, Lath. Gen. Synop. i. pt. 1, p. 406 (1781).

Le Rollier vulgaire, Levaill. Hist. Nat. Roll. et Geais, i. p. 90, pls. 32, 33 (1806).

Galgulus garrulus (Linn.), Vieill. Nouv. Dict. xxix. p. 428 (1819); Roux, Orn. Provenç. pl. 139 (1825); Ménétr. Cat. Raisonn. p. 44 (1832).

Galgulus garrula (Linn.), Vieill. Faun. Franç. p. 128, pl. 57. fig. 2 (1821).

Coracias germanicus, C. L. Brehm, Vög. Deutschl. p. 158 (1831).

Coracias planiceps, C. L. Brehm, op. cit. p. 159 (1831).

? *Coracias loquax*, Licht. Nomencl. Av. p. 68 (1854).

Coracias glaucopteros, L. Brehm, Naumannia, 1855, p. 271.

Coracias bengalensis (nec Linn.), Keulem. Nederl. Tijdschr. iii. p. 380 (1866).

Coracias garrulus, Linn., Giebel, Thes. Orn. i. p. 772 (1872); Cab. J. f. O. 1878, p. 234; Dresser, B. of Eur. v. p. 139 (1880); Wardlaw Ramsay, Ibis, 1880, p. 50; Newton in Yarr. Brit. B. ed. 4, ii. p. 428 (1881); Biddulph, Ibis, 1881, p. 48; Gurney, tom. cit. pp. 124, 256; Scully, tom. cit. p. 429; Salvin, Cat. Strickl. Coll. p. 411 (1882); C. Swinhoe, Ibis, 1882, p. 102; Gurney, Ibis, 1891, p. 296; Sharpe, Cat. B. Brit. Mus. xvii. p. 15 (1892).

Rollier vulgaire, *Geai d'Afrique*, French; *Blauracke*, *Mandelkrähe*, German; *De Racke*, Dutch; *Carlanco*, *Carranco*, *Galgulo*, Spanish; *Rolheiro*, Portuguese; *Ghiandaja marina*, Italian; *Ellekrag*, Danish; *Blaakraake*, Norwegian; *Blåkråka*, *Spansk-Kråka*, Swedish; *Sininärhi*, Finnish; *Civovoronka*, Russian; *Kapka*, Georgian; *Kraska*, Galician; *Zöld-Czoka*, *Kalangya-Varju*, Transylvanian; *Mandelik*, *Krakal-zoatlavy*, *Rapak*, Bohemian; *Chalkoroni*, *Adkokoroni*, Greek; *Ko-Karga*, *Alla-Karga*, *Jeshil-Karga*, Turkish; *Shararakak*, Moorish; *Shugurug*, *Schurkrak*, Arabic; *Subz-Kullag*, Persian; *Sheen-Tootee*, Pushtoo.

Figure notabiles.

Edwards, Nat. Hist. B. pl. 109; D'Aubenton, Pl. Enl. no. 486; Levaillant, Hist. Nat. Roll. et Geais, pls. 32, 33; Vieill. Faun. Franç. pl. 57. fig. 2; Naumann, Vög. Deutschl. pl. 60; Werner, Atlas, Omnivores, pl. 17; Kjörb. Orn. Dan. pl. 13. fig. 4; Reichenbach, Merop. pl. 431. figs. 3179, 3180; Schlegel, Vog. Nederl. pl. 135; Gould, B. Great Brit. ii. pl. 11; Fritsch, Vög. Eur. Taf. xiv. fig. 2; Sharpe & Dresser, B. of Eur. pl. 293; Sundevall, Svenska Fogl. pl. xxi. fig. 3; Lilford, Col. Fig. Birds Brit. Isl. part xii.

HAB. Western Palæarctic Region, ranging east to Central Asia and N.W. India, and the Ethiopian Region.

Ad. fronte et mento albidis: capite toto, tectricibus alarum et corpore subtus cæruleis, viridi lavatis: tectricibus alarum minoribus et uropygio ultramarinis: dorso, scapularibus et secundariis intimis cinnamomeis: remigibus ad basin pallidè cæruleis et aliter nigricantibus: pogonio interno subtus ultramarino: rectricibus duabus mediis olivascenti-viridibus, reliquis ad basin sordidè cæruleis suprâ et subtus ultramarinis, versùs apicem pallidè cæruleis, duabus extimis nigro apicatis: genis et gutture imo argenteo-cyaneo longitudinaliter striatis: rostro nigro: pedibus flavido-fuscis: iride griseo-fuscâ.

Juv. coloribus pallidioribus et sordidioribus: capite et gutture cervino lavatis: dorso cum scapularibus et secundariis intimis pallidè cervino-cinnamomeis: primariis angustè cervino-fusco apicatis.

Adult male (Taurus, 20th April).—Crown, nape, sides of the head, and underparts generally pale blue, tinged with green, darker on the head and throat and paler on the abdomen; forehead and chin hoary white; throat marked with narrow stripes of silvery blue; back, scapulars, and innermost secondaries cinnamon-brown; rump, upper tail-coverts, and least wing-coverts rich deep ultramarine-blue; quills brownish black, the outermost glossed with deep blue on the outer web, basal portion of the quills light blue; primaries with the inner web for the most part deep ultramarine on the under surface; median and larger wing-coverts pale blue; central rectrices dull greenish blue, the others on the basal portion dull blue above and rich ultramarine below, the terminal portion pale blue, the two outer feathers with a blackish spot at the tip: bill black; legs yellowish brown; iris brownish grey. Total length about 12 inches, culmen 1·3, wing 7·7, tail 5·0, tarsus 0·95.

Adult female.—Resembles the male.

Young (Southern India).—Much paler and duller in coloration; head and breast washed with pale buff; back, scapulars, and inner secondaries dull buffy cinnamon-brown; primaries narrowly tipped with buffy brown; tail paler and duller than in the adult.

THE range of our European Roller extends throughout Europe, excepting in the high north, eastward to Central Asia and North-western India, and southward to the southern portions of Africa. With us in Great Britain it is a rare straggler, but has been recorded from various parts of our islands at least a hundred times during the spring and autumn migrations, chiefly, however, in the autumn, and it has been obtained as far north as the Orkneys and Shetland. It has been recorded from Ireland much less frequently than from England and Scotland, the occurrences not having been more than, according to Mr. Saunders, five or six, at long intervals.

It has once been recorded from the Færoes, a female, which is now in the Copenhagen Museum, having been obtained near Thorshavn on the 22nd July, 1836, and it occurs in Southern Scandinavia not unfrequently. Collin (*l. c.*) notes many instances of its occurrence in Denmark during the last half-century, chiefly in the spring; and in Norway, according to Prof. Collett, it is met with in Southern Norway singly or in pairs in the spring and summer, but not every year, and its occurrence in Norway was recorded by Brünnich as far back as 1764. One was shot at Foldalen in the birch region of the Doose in July 1872, and one was obtained as far north as Varanger, in 70° N. lat., in October 1868. It has not been known to breed in Norway, but evidently breeds in Southern Sweden, for Prof. Sundevall states that it arrives there early in May and leaves about the end of August; but in the neighbourhood of Stockholm its stay is a shorter one. It occurs in Sweden up to about 60° N. lat. on the northern boundary of the oak region, and is not uncommon near Stockholm and Upsala, but is rare near Gefle, above which it only occurs as a rare straggler.

Throughout continental Europe it is very generally distributed. In Holland it is only met with as a somewhat rare visitant, and in Belgium it is, according to M. Fallon, "of rare and accidental occurrence during the summer and always seen singly. The Notary, M. Morimont, of Jambes has killed it near Namur, and Baron de Selys-Longchamps cites two or three instances of its having been killed in the wooded mountains on the banks of the Ourthe." In France it occurs in the northern districts on passage, but breeds in the south. M. A. Lacroix says that it occurs on passage in the French Pyrenees, where it has been obtained in April, June, July, and August. In Portugal it is a rare bird, and Mr. Tait writes ('Ibis,' 1887, p. 305) respecting its occurrence there as follows:—"So far as my experience goes, the Roller is uncommon in Portugal. Dr. P. d'Oliveira, of Coimbra, showed me a specimen in his collection, and the wing was given to me of one which had been shot near Palhal copper-mines, Albergaria Velha. Under date of July 20th, 1883, Dr. Carvalho, of Coimbra, wrote me that a specimen had just arrived from the Coimbra Museum. I was disappointed at not meeting with this species on the banks of the Guadiana and in the Algarve, in April."

In Spain, however, it is, though somewhat local, a common bird, and found numerously in some parts. I have met with it near Madrid and in Andalucia and Catalonia, and Mr. Saunders states (*l. c.*) that in Southern Spain it generally arrives early in April and swarms throughout the country. Col. Irby, however, remarks that "in Andalucia they are very local. I have seen one or two in May near Casa Vieja, but they are not common nearer to Gibraltar than the vicinity of Seville. Thence along the valley of the Guadalquivir to Cordova they abound. I never saw one about Gibraltar. They arrive during the latter end of March, leaving by September."

Passing eastward again one finds the Roller fairly distributed throughout continental Europe. In the northern portions it is tolerably common in some localities. It breeds regularly in Brunswick and also in many other parts of Germany; von Homeyer observed it between Mainz and Darmstadt in June; it is found during the summer in Schleswig and Schwerin, and breeds quite commonly in Mark Brandenburg, but is said by Dr. Schalow to be rare in Niederlausitz. I have frequently taken its nest in Pomerania, and it is said to be a tolerably common summer resident throughout Eastern

Germany, arriving from the south early in May and leaving again in September. Taczanowski speaks of it as being common in summer in Poland; and in Russia, as in Eastern Germany, it is a common summer visitant, ranging northward into Finland, where, however, it becomes rare and does not appear to have been recorded north of Helsingfors except as a very rare straggler; but two specimens have been obtained as far north as the Varanger Fjord, the first of which was procured in an exhausted condition near Nyborg in October 1868, and the second in November the same year. Throughout Central Russia it appears to be very generally distributed during the summer, and, judging from the number of skins sent from Sarepta on the Volga, it must be very common there. Dr. Radde also speaks of it as being common in the Caucasus from April to September, and in Transcaspia both Radde and Zarudny found it equally numerous. In Southern Europe I find it recorded as by no means common in Switzerland, but it occurs regularly in Savoy at the two seasons of migration. In Italy it is not very common, but occurs in spring and autumn and a few breed there. In Sardinia it is scarce and is said to occur on passage in spring, and in Sicily it is, according to Malherbe, a summer visitant, arriving early in April, remaining to breed, and leaving again in September; but it has, Count Salvadori says, not been recorded from Corsica, although it is said to be numerous at Malta, from which island Mr. C. A. Wright has sent many specimens. In Greece it breeds in considerable numbers; and Lord Lilford met with it in Corfu, where it arrives about the middle of April, and passes on to the mainland to breed. Throughout Southern Germany, Austria, the countries bordering the Danube, Turkey, South Russia, and in Asia Minor it is a common summer resident, as it is also, according to Lord Lilford, in Cyprus.

Dr. Tristram writes (*l. c.*) that in Palestine it "appears in large flocks about the 1st of April, and they very gradually disperse themselves over the whole country, breeding in burrows in sand or gravel banks, very often in small colonies, and more frequently in single pairs by themselves in a hollow tree or rocky cleft. Brilliant and conspicuous both in plumage, note, and manners, the Rollers attract attention everywhere, and are found in every kind of country alike, woodland, plain, desert-ravines, ruins, always perching where they can see and be seen."

It is found in Arabia: Yerbury records it from Aden, where it appears, he says, to be resident. Mr. Cumming states that at Fao, in the Persian Gulf, it is a migrant, passing in large flocks from S.E. to N.W. in May and returning, though in very small numbers, in September and October, and Dr. Sharpe records it from Bushire.

According to Mr. Blanford (*l. c.*) "the European Roller is a migratory bird in Persia, arriving in the spring and breeding on the highlands. In Baluchistan, which country it traverses in the same manner as *Merops apiaster* and *M. ægyptius* do, I first saw it on the plains near Bampur in the second week in April. I doubt if it remains there to breed. Most probably this Roller and the two Bee-eaters cross the hot regions near the shores of the Indian Ocean and the Persian Gulf and betake themselves to the highlands of Central Asia, Persia, Afghanistan, Turkestan, &c. So far as I know, none remain in Southern Persia in the winter, but all cross over into Arabia. Whether they remain there or continue their journey to Africa we shall probably learn when some adventurous ornithologist explores the oases of Central Arabia, the hills and valleys of Ornán, and the palm groves of the coast north of Maskat. I did not notice any Rollers at Basrah in December; but the chilly climate of Mesopotamia at that season is ill suited for a purely insectivorous bird, and it is far more probable that this species would be met with in the extensive date-palm groves which line many parts of the Arabian coast in the Gulf of Oman and the Persian Gulf, just as *Coracias indica* inhabits those on the Persian shores of the same seas." To this Sir Oliver St. John adds that this species "seems to leave Persia altogether in the winter, reappearing in Bushire, on its way north,

about the end of March or beginning of April. It is found in the summer all over Persia, at all habitable altitudes, generally breeding in ruined mud walls or kanáts." Capt. Hutton, Col. Swinhoe, and Sir O. St. John record it from Afghanistan, and Col. Biddulph and Mr. Scully from Gilgit. According to the latter it is "plentiful in the hottest valleys of the Gilgit District throughout the summer, and there makes day hideous with its harsh grating cry; it does not appear to ascend above 6000 feet. In 1880 it made its first appearance in Gilgit on the 30th April. Most of these birds leave us in October; but I have observed stragglers as late as the 11th November." Mr. A. O. Hume records it from Sind, Mooltan, Peshawur, Simla, and Nynee-Tal, the last-named locality being, he remarks, probably its eastern limit in India. It winters in North-western India and breeds in Kashmir and the Peshawur Valley. Where the present species meets with *Coracias indicus*, it doubtless interbreeds, and Blyth records a specimen from Kashmir intermediate between these two species. In Eastern Russia the Common Roller occurs in the Transcaspian region, Turkestan, and Western Siberia, and Dr. Otto Finsch writes respecting its range there (*l. c.*) as follows:—"We frequently met with the Roller in Southern Siberia, where it affected the vicinity of the steppe rivers, and nested on their banks. On the 12th and 18th May we met with it on the river Kysil Aschdschi in the steppe south of Ala-kul, on the 19th at Urdschar in Turkestan, on the 22nd behind Tschugutschak, and on the 29th June behind Barnaul. In the Slovzoff Museum in Omsk were specimens from that vicinity."

In Africa it has been recorded from various localities down to the Cape Colony. It is common in Egypt and Nubia, where, however, it is, according to Capt. Shelley (*l. c.*), "only a bird of passage, arriving on its way north about the end of April. I first met with it at Koos on the 26th of that month; and two days later I killed three out of a party of four that I saw near Dendera. In the spring of the year they are not rare in Egypt. They are rather shy; but, owing to a fancy they appear to have for certain clumps of trees, they may be easily obtained by waiting near where they are first seen, and then getting them driven back by a companion. The birds which I shot at Dendera were obtained in this manner, as they had at first slipped out at the further side of the clump and settled in the open fields. The food of the three that I examined consisted entirely of beetles."

Von Heuglin met with it during the winter on the Somali coast, in Abyssinia, and on the upper White Nile. It has been recorded from various parts of North Africa by different naturalists. Dr. König found it common in Tunis and Tripoli, where it breeds. Mr. Salvin records it also from Algeria as common and breeding in May; and Col. Irby and Mr. Tyrwhitt Drake, who met with it near Tangier and in Eastern Morocco, say that it occurs in large numbers on passage in April and May, and again in August. The former found it breeding at Larache, and the latter remarks that it "breeds further down the west coast." It has been met with in various parts of the African Continent down as far as the Cape Colony. Verreaux received it from Senegal. Professor Barboza du Bocage records it from Angola. Andersson found it common in Ondongo, but less so in Damara-land proper than *C. pilosa* or *C. caudata*, occurring only in the rainy season; and Dr. Sharpe states (in Layard's B. of S. Afr. p. 102) that it "has not yet been noticed in any numbers within the Cape Colony and is doubtless only a winter visitant. We believe it to be the species noticed under the heading of *C. abyssinica* in the first edition, for it has been pointed out that *C. garrula* is exactly similar to that species without the elongated tail-feathers (*cf.* Sharpe, Ibis, 1871, p. 201). We consider that *C. abyssinica* is confined to North-eastern Africa and Western Africa, and has not yet appeared in South Africa at all. The European Roller has been received from one or two places along the northern border of the colony, also from the neighbourhood of Spring-bok Fountain in

Namaqualand. Mr. Rickard tells us that he once saw a Roller apparently of this species near East London. It has been killed in Natal by Mr. Ayres, Mr. Mohr, and other collectors, and Captain Shelley recently obtained a specimen from the neighbourhood of Pinetown, but it was considered to be by no means common in that locality. Mr. Ayres has recently forwarded a specimen from the Transvaal, which he says was killed amongst some bushes about three miles from Potchefstroom in the month of December." It has also been recorded from near Pretoria by Barratt, from Tati by Oates, from the Orange Free State by Symonds, Palatswie Pan, Bamangwato, and the Usambara Mountains by Shelley, the Zambesi by Serpa Pinto, and Massa in Galaland by Fischer. It is also said to have been obtained in Madagascar; Weiss obtained it in the island of St. Thomas, Keulemans in Princes Island, and it is said to be not very uncommonly met with in the Canary Islands during the seasons of migration.

In habits the Roller is restless and uneasy, except during dull and wet weather, when he becomes heavy and mopes. It frequents thin woods and groves and also bush-covered places. It usually settles on the summit of a tree or on a dead branch, and is also often found perched on a telegraph pole or wire. Robson says that it is often found on low trees or bushes and on earth clods, where it will sit for some time watching for the insects on which it feeds, and he also says that he has seen them catch beetles on the wing. It does not hop about amongst the branches, but flies from bough to bough. Its flight is quick and easy and reminds one both of that of a Jackdaw and a Pigeon, but it has a habit of rolling or overbalancing itself on the wing like the latter bird.

Its note, from which its name in several languages is derived, is harsh and discordant, and may best be compared with that of the Magpie. It may be described as a deep harsh *Racker-racker-racker-racker*, which is very quickly uttered when the birds are squabbling, and with it is mingled a harsh *rräh*. When sitting quiet the note is a harsh *rack* and *rack-rack*, and also a plaintive high *kräh*, not unlike that which a young Jackdaw sometimes utters, this last being the call-note. These notes are often varied, and the bird is generally heard before it is seen. In fine weather the male rises in the air near where the female is incubating, uttering a single *rack*, *rack-kack*, until he attains a considerable altitude, from whence he suddenly falls, always turning a somersault, and throwing himself here and there in the air, uttering quickly the notes *räh*, *räräh*, *rrhä-rrä*, &c., which he always changes to the *rack* directly he begins to turn his somersault, and then returns to his seat on a dead branch.

The food of the Roller consists of insects of various kinds, grasshoppers, locusts, beetles, caterpillars, worms, &c. and small frogs, the food being picked up from off the ground and seldom obtained amongst the branches or the foliage of trees. As a rule, it is not a vegetable or fruit eater, but von der Mühle states that in Greece it devours figs in the autumn and becomes then very fat. The breeding-range of the Roller is extensive, extending from North Africa up to the northern portions of continental Europe and even Southern Sweden. Nidification takes place in April, May, or early in June, according to latitude. So far as my own experience goes, I have only found the Roller nesting in hollow trees, usually in oaks; but it varies in the choice of its nesting-place according to circumstances: thus Col. Irby found its nest in old walls and ruins; Lord Lilford says that in Greece he found nests in an old wall and in a hole in a river-bank; and von der Mühle met with it breeding at Negropont under the eaves of roofs, the nest being constructed of roots and lined with hair. Canon Tristram in Palestine and Blanford in Persia also found it nesting in banks and walls. At Turbali, in Asia Minor, Dr. Krüper on several occasions found Rollers making use of old Magpies' nests which had not lost the covering roof. The nest is constructed of roots and straws internally lined with hair or feathers, but occasionally the eggs are deposited in a hole without any

nest. They nest singly and not in colonies, except in very rare cases; indeed von der Mühle, who states that he found them nesting in colonies on the southernmost point of Europe (in Greece), appears to be the only observer who has found them thus breeding. As a rule the Roller prefers a sandy country during the breeding-season and affects the open woods or groves and not the dense forest. Although at other seasons a somewhat shy bird, yet during the nesting-season the Roller becomes much tamer, especially when found breeding near habitations, and will fly round quite close chattering and screaming when its nest is approached.

The eggs, from four to five in number, are pure white, rounded in shape, and very glossy in texture of shell, and measure from 1·35 by 1·05 inch to 1·50 by 1·20 inch.

The specimens figured and described are in my own collection.

In the preparation of the above article I have examined, besides the series in the British Museum, the following specimens:—

E Mus. H. E. Dresser.

a, ♂ ad. Giaour-keui, Taurus, 20th April, 1876 (*C. G. Danford*). *b*, ♂ ad. Shiraz, Persia, June 1869 (*Sir Oliver St. John*). *c*, juv. Southern India (*J. Backhouse*). *d*, ♂ ad.; *e*, *f*, ♀ ad. Sarepta, South Russia (*Dr. Stader*).

E Mus. Palæarct. H. E. Dresser.

a. Alexandria (*S. Stafford Allen*). *b*. Seville (*Howard Saunders*). *c*, *d*. Egypt (*G. E. Shelley*). *e*, *f*, *g*. Malta (*C. A. Wright*).

E Mus. H. B. Tristram.

a. Tinwald, Dumfries, November 1864. *b*. Malta, April (*A. L. Adams*). *c*, ♂. Koleh Forest, Algeria, 20th May, 1856 (*H. B. T.*). *d*. S. Africa (*E. L. Layard*). *e*, *f*, ♂ ♀. Mount Tabor, 4th April, 1864 (*H. B. T.*). *g*, *h*. Hamath and Aleppo, May 1881 (*H. B. T.*). *i*, ♂. Plain of Issus, 24th June, 1881 (*H. B. T.*). *k*. India (*T. C. Jerdon*).

E Mus. H. Seebohm.

a, *b*, ♂. Tschinas, Russia, 9th April, 1878 (*Russow*). *c*, ♂; *d*, ♀. Chorum, Asia Minor, 15th May, 1876 (*C. G. Danford*). *e*, ♂; *f*, ♀. Sarakhs (1000 feet), 20th May, 1878.



Hartn. imp.

INDIAN ROLLER.
CORACIAS INDICUS.

J.G. Keulemans del.

CORACIAS INDICUS.

INDIAN ROLLER.

The Jay from Bengal, Albin, Nat. Hist. B. i. p. 17, pl. 17 (1738).

Galgulus mindanoensis, Briss. Orn. ii. p. 69, pl. vi. fig. 1 (1760).

Coracias indica, Linn. Syst. Nat. i. p. 159 (1766); P. L. S. Müller, Natursyst. ii. p. 83 (1773); Gmel. Syst. Nat. i. p. 378 (1788); Lath. Ind. Orn. i. p. 170 (1790); Shaw, Gen. Zool. vii. part 2, p. 390 (1809); Vieill. Nouv. Dict. xxix. p. 432 (1819); Dumont, Dict. Sc. Nat. xlv. p. 184 (1827); Eyton, Proc. Zool. Soc. 1832, p. 96; Sykes, Journ. As. Soc. Beng. iii. p. 541 (1834); Gray, Gen. B. i. p. 61 (1845); id. Cat. Mamm. &c. Nepal pres. Hodgs. p. 55 (1846, pt.); id. Cat. Fissir. Brit. Mus. p. 33 (1848); Blyth, Cat. B. Mus. As. Soc. p. 51 (1849); Bp. Consp. Gen. Av. i. p. 167 (1850); Kelaart, Prodrum. p. 118 (1852); Layard, Ann. & Mag. Nat. Hist. xii. p. 171 (1853); Hartl. Journ. für Orn. 1854, p. 154; Bp. Consp. Volucr. Anisod. p. 7 (1854); Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 571 (1856); Irby, Ibis, 1861, p. 228; Jerdon, B. Ind. i. p. 214 (1862); Beavan, Ibis, 1865, p. 407; Blyth, Ibis, 1866, p. 345; Schlegel, Mus. Pays-Bas, *Coraces*, p. 135 (1867); Gray, Hand-l. B. i. p. 76, no. 900 (1869); Gould, B. of Asia, i. pl. 54 (1869); Elwes, Ibis, 1870, p. 527; Holdsworth, P. Z. S. 1872, p. 423; Blyth, Ibis, 1873, p. 80; Hume, Nests & Eggs of Ind. B. i. p. 103 (1873); R. M. Adam, Stray Feath. i. p. 373 (1873); Hayes Lloyd, Ibis, 1873, p. 406; Hume, Stray Feath. i. p. 167 (1873); Ball, Str. Feath. ii. p. 386 (1874); Morgan, Ibis, 1875, p. 314; Butler, Stray Feath. iii. p. 456 (1875); Schalow, Journ. f. Orn. 1876, p. 176; Bourdillon, Stray Feath. iv. p. 382 (1876); Selater, Ibis, 1876, p. 63; Blanf. E. Pers. ii. p. 126 (1876); Fairbank, Str. Feath. vi. p. 394 (1877); Davidson, Str. Feath. vii. p. 77 (1878); Ball, tom. cit. p. 259 (1878); Cripps, tom. cit. p. 259 (1878); Legge, B. of Ceylon, p. 281 (1878); Danford, Ibis, 1878, p. 7; Hume, Str. Feath. viii. p. 85 (1879); Scully, t. c. p. 237 (1879); Doig, t. c. p. 370 (1879); Butler, Cat. B. of Sind &c. p. 16 (1879); Wardlaw Ramsay, Ibis, 1879, p. 446; id. op. cit. 1880, p. 50; Butler, Cat. B. S. Bomb. Pres. p. 18 (1880); Vidal, Str. Feath. ix. p. 49 (1880); Davids. Str. Feath. x. p. 295 (1882); Davison, t. c. p. 351 (1883); Murray, Vertebr. Faun. Sind, p. 109 (1884); Swinhoe & Barnes, Ibis, 1885, p. 61; Sharpe, Ibis, 1886, pp. 165, 488; Reid, Cat. Lucknow Mus. p. 22 (1886); Taylor, Str. Feath. x. p. 456 (1887); Terry, t. c. p. 471 (1887); Sir O. St. John, Ibis, 1889, p. 157; Sharpe, P. Z. S. 1890, p. 547; Oates, ed. Hume's Nests & Eggs Ind. B. iii. p. 53 (1890).

Coracias bengalensis, Linn. Syst. Nat. i. p. 159 (1766); P. L. S. Müller, Natursyst. ii. p. 183 (1773); Gmel. Syst. Nat. i. p. 380 (1788); Lath. Ind. Orn. i. p. 168 (1790); Daudin, Traité d'Orn. p. 259 (1800); Steph. in Shaw's Gen. Zool. xiv. p. 71 (1826); Frankl. Proc. Zool. Soc. 1830, p. 121; Pearson, J. As. Soc. Beng. x. p. 651 (1841); Hodgs. Icon. ined. Passeres, pl. xii. fig. 1 (no. 613); id. in Gray's Zool. Misc. p. 82 (1844); icht. Nomencl. Av. p. 68 (1854); Cab. & Heine, Mus. Hein. ii. p. 118 (1859-60).

Le Rollier de Mindanao, Montbeill. Hist. Nat. Ois. iii. p. 144, Pl. Enl. 285 (1775).

Indian Roller, Latham, Synopsis, i. p. 412 (1781); Shaw & Nodder, Nat. Misc. viii. pl. 273.

Bengal Roller, Latham, ut suprâ (1781).

Coracias benghalensis, Linn. Bodd. Tabl. Pl. Enl. p. 17 (1783).

Le Rollier varié d'Afrique, Levaillant, Hist. Nat. Roll. et Geais, i. p. 80, pl. 28 (1806).

The Blue Jay from the East Indies, Edwards, Gleanings, iii. p. 247, pl. 326 (1806).

Garrulus navius (nec Licht.), Vieill. Nouv. Dict. xxix. p. 431 (1819).

Galgulus navius (nec Licht.), Vieill. Tabl. Encycl. et Méthod. ii. p. 868 (1823).

Coracias navius (nec Licht.), Wagler, Syst. Av. *Coracias*, no. 3 (1827); Lesson, Traité d'Orn. p. 354 (1831).

Coracias bengalensis indica, Temm. Tabl. Méth. p. 10 (1839).

Coracias (Galgulus) indica (Linn.), Reichenb. Meropinae, p. 48, pl. 433. fig. 3185 (1852).

Coracias indicus, Linn. Cabanis & Heine, Mus. Hein. ii. p. 118 (1859-60); Dresser, B. of Europe, v. p. 149, pl. 294 (1878); Col. Swinhoe, Ibis, 1882, p. 102; Salvin, Cat. Strickl. Coll. p. 411 (1882); Cordeaux, Ibis, 1891, pp. 147, 149; Sharpe, Cat. B. Brit. Mus. xvii. p. 10 (1892).

Coracias garrula (nec Linn.), Cordeaux, Zoologist, 1884, p. 185.

Subzak, i. e. Greenish bird; *Nilkant*, i. e. Blue-throat, Hindustani; *Tas*, Mahratta; *Pálú pitta*, i. e. Milk-bird, Tel.; *Katta-kade*, Tam.; *Towe*, Mhari (*fide* Jerdon); *Doong-kowluwa*, i. e. Smoke-bird, Sinhalese; *Panang-karda*, Tamils, North Ceylon (*fide* Legge); *Kotta-killi*, i. e. Palmyra Parrot, North Ceylon (*fide* Layard).

Figurae notabiles.

D'Aubenton, Pl. Enl. 285; Levaillant, Hist. Nat. Roll. et Geais, i. pl. 28; Edwards, Gleanings, iii. pl. 326; Reichenbach, Meropinae, pl. 433. fig. 3185; Gould, B. of Asia, part xxi. pl. 54; Dresser, B. of Europe, pl. 294.

HAB. South-eastern portion of the Western Palearctic Region, and the Indian Peninsula as far east as Calcutta; Ceylon.

Ad. Fronte et mento rufescenti-cervinis: pileo viridi-cæruleo: collo postico purpureo cervino: corpore suprâ viridi-fusco: uropygio viridi-cæruleo: supracaudalibus saturatè ultramarinis: remigibus primariis pallidè cæruleis, fasciâ magnâ centrali saturatè ultramarinâ, et nigro-cæruleo apicatis: secundariis ad basin pallidè cæruleis et in parte apicali ultramarinis: tectricibus alarum majoribus viridi-cæruleis, et tectricibus minoribus ultramarinis: gulâ et gutture purpureo-vinaccis cervino-striatis: pectore imo rufescenti-cervino: corpore reliquo subtùs viridi-cæruleo: rectricibus centralibus saturatè viridibus, reliquis ultramarinis fasciâ magnâ cæruleâ: rostro nigro-fusco: iride rufescenti-fuscâ: pedibus sordidè aurantiaco-flavis.

Juv. Adulto similis, sed coloribus sordidioribus: pileo sordidè viridi-fusco, cervino-fusco tincto: corpore suprâ sordidè viridi-fusco: corpore subtùs pallidiore: gulâ et gutture vix vinaceo-purpureo tinctis.

Adult male (Gurdara, 4th February).—Forehead rufous buff; crown rich blue-green; hind neck warm rufous buff, with a purplish tinge; back, scapulars, and some of the innermost secondaries warm greenish brown; rump greenish blue; upper tail-coverts rich ultramarine-blue; primaries pale greenish blue, with a broad ultramarine central band and tipped with blackish blue; secondaries pale greenish blue on the basal and rich ultramarine on the terminal portion; larger wing-coverts deep greenish blue; lesser coverts deep ultramarine; central rectrices deep green, the remaining rectrices deep ultramarine on the basal and terminal portions, otherwise pale blue; chin warm rufous buff; throat and upper breast vinous purple, striped with creamy buff; lower breast rufous buff; rest of the underparts greenish blue: bill blackish, paling to reddish at the base beneath; legs dusky orange-yellow; iris grey or yellowish grey, with a rufescent-brown inner circle; orbital skin and eyelid dull orange-yellow. Total length about 13·5 inches, culmen 1·3, wing 7·2, tail 5·3, tarsus 1·0.

Adult female.—Resembles the male.

Young female (Sikkim Terai).—Differs from the adult in being much duller in colour, the crown being dull greenish marked with buffy brown, the nape and back dull greenish brown, and the throat

and underparts are duller and paler in colour, the former being but little tinged with vinous purple. According to Legge the young bird has the iris brown, the grey outer portion in the adult reduced to a narrow ring; this latter increases with age very gradually, imparting considerable variation to the eye; bill blackish brown, pale or reddish at the base beneath; tarsus slightly tinted with olivaceous; gape yellowish.

THE true home of this Roller is, as its name implies, India, where it ranges eastward to the district of Calcutta, where it meets and frequently interbreeds with *Coracias affinis*, but is found westward through Persia to Asia Minor, and has even occurred as far west as Turkey, for there is in the Museum of the Bebek College, Constantinople, a single specimen which Dr. Sclater writes ('Ibis,' 1876, p. 63) "is stated to have been shot on the railway-line on the Asiatic side of the Bosphorus, between Haider Pacha and Ismidt. Mr. W. Pearse of Haskœui, who is engaged in obtaining specimens to supplement the series, told me that he received the skin of the bird when quite fresh, and that it was shot in company with a flock of the Common Roller (*C. garrula*)."

Mr. Danford met with it in Asia Minor, where, he says, it was once seen in the level country at the base of the Ala-dagh between Giaour-keui and Bereketlii. Sharpe records it from Muscat in Arabia, and Mr. Cumming, who sent a specimen from Fao on the Persian Gulf, says that there it is migratory; only two specimens were seen and shot, one on the Persian side of the river, and the other at Fao, an old fort only a short distance from the telegraph buildings. Dr. Sclater has examined specimens obtained at Bundar Abbas by the Marquis Doria in 1862, now in the Civic Museum of Genoa; and according to Blanford (*l. c.*) it "inhabits somewhat sparingly the countries of Southern Persia and Baluchistan, which are below the level of 3000 feet above the sea, its range in these countries being nearly the same as that of the date-palm. De Filippi, on the authority of the Marchese Doria, gives as its habitat in Persia 'beyond Isfahán, in the region of the palms'; but no palms are met with so far north as Isfahán, except on the edge of the salt desert north of Yegd, and I think that beyond (*i. e.* south of) Shiraz would more accurately represent the range of the bird. It extends west as far as the neighbourhood of Bushire. Whether it is found at the extreme north end of the Persian Gulf or on the south-west coast of the Gulf in Arabia, I cannot say. On the few occasions on which I saw this Roller in Baluchistan it was on the date-palms. It is of course non-migratory, the region which it inhabits being sufficiently warm to furnish a supply of insect food at all seasons." To this Sir Oliver St. John adds that it is "non-migratory, and found only in the palm-groves on the coasts and in the neighbouring valleys. About Daliki and Khisht both species of Roller are abundant in spring and summer, the European bird spending its winter in Arabia, while *C. indicus* remains at home. In these places I shot a great many specimens in the hope of finding a hybrid, but without success."

It is found in Afghanistan, and Col. Swinhoe observed it near Sibi at Pirchorosky and in the lower part of the Bolan, and he was given to understand that it is sometimes found at Quetta. Sir O. St. John doubts if it occurs above 1500 to 2000 feet in Afghanistan.

Capt. Wardlaw Ramsay states that it was not uncommon near the skirts of the pine-forest at Byan-Kheyl, and he is nearly certain that a Roller which was found, though not common, in the Hariah district is referable to the present species and not to *C. garrulus*. According to Dr. Jerdon, it is "distributed throughout the whole of India from Ceylon and Cape Comorin to

the base of the Himalayas; towards the north-east of our limits it begins to disappear, and is replaced by *C. affinis*, and in the extreme north-west its place is taken by *C. garrulus* of Europe and Western Asia. Adams asserts that it is also found in Ladakh and Tibet, and he ignores the existence of *C. garrulus* in the north-west." In some parts of India it is said to be a partial migrant and in others a resident, this being probably, in the former case, owing to its avoiding the extreme heat of some parts of the country which it inhabits, and it is said to be much more often met with on the plains than in the wild hilly districts. Mr. A. O. Hume states that it is in the Terai between Darjeeling and in Eastern Bengal that the range of the present species meets that of *Coracias affinis*, and where they commence to interbreed. In Ceylon, Mr. Holdsworth remarks, though locally common in the north, he never met with it in the Aripu district nor in the south of the island, though he often did so between Colombo and Kandy; and Captain Legge states that its distribution in the island is very local, as it dwells in the dry portions of the island, migrating to the damp district of the west chiefly during the dry season. Its head-quarters may be said to be the Jaffna peninsula, the open portions of the northern sea-board, and certain parts of the interior of the Northern and N.W. Provinces, where it is common in many parts and absent from others. He did not observe it in the Aripu district, though it occurs on the adjacent island of Manaar. "To the south of the jungles bordering the coast of the Bay of Kalpentyne," he writes, "it is not uncommon. I have seen it in the Kalpentyne peninsula itself, and about Puttalam and Chilaw it is a well-known bird. It is resident as far south as Madampe, and likewise in the region between that and Kurunegala; but below this line it occurs chiefly as a straggler between the months of October and March. In this season it may often be seen about Veangodde and Ambepussa, and I have procured it in the Hewagam Korale, a little to the south of Colombo, in July. I doubt, however, if it resides in that district. I have never seen or heard of it to the south of the Kaluganga, nor did I meet with it in the very likely country between Haputale and Hambantota. It may occur in the Eastern Province, but I have no information to that effect. In the Trincomalie district it is now and then seen from December to February; but a little inland, about Ratmalie, it is common enough. Eastward of this point, through the centre of the island, it musters, as above remarked, strongly, confining itself, of course, to open districts, fields surrounded by the village tanks, and dried-up paddy-land. Even here, however, it is local; for although it is common near Hurullé, I have never seen it about Haboreenna, which is separated from the former place by a tract of forest."

This Roller has even been stated to have straggled as far north and west as England; but as the specimen recorded came through a bird-stuffer's hands there is just a possibility of its having been in error changed with a specimen of *Coracias garrulus*, as hundreds of the Indian Roller are imported into this country for plumes, and are to be met with at bird-stuffers' shops all over the country. However, Mr. Cordeaux, who first recorded its occurrence here, states (*l. c.*) that "there is perfectly satisfactory evidence that the bird was obtained as described, and that there is no possibility of its having been exchanged for any foreign skin of a Roller; there are also no indications of its having been an escaped bird." The specimen in question was shot at Muckton, near Louth, Lincolnshire, on the 27th October, 1883, by a cottager, and sent to Mr. Kew, the Louth bird-stuffer and hair-dresser, in the flesh. Mr. Cordeaux saw it when set up and drying, bound up with coarse cotton thread over slips of wood to keep the feathers in position, but did not then recognize it as being the Indian Roller, but subsequently when able better to examine it he saw what it was, and obtained it from Mr. Kew, and has since presented it to the Cambridge Museum. It was sent to me for examination by Professor Newton, and it is certainly referable to the present species, but it appears strange that it should stray so far out of its normal range.

In its habits the Indian Roller does not appear to differ from its European ally. Jerdon says that it "frequents alike open jungles, groves, avenues, gardens, clumps of trees in the open country, and, except in thick forest, is to be found everywhere, and is sure to be met with about every village. It generally takes its perch on the top or outermost branch of some high tree, and, on spying an insect on the ground, which it can do at a very great distance, it flies direct to the spot, seizes it, and returns to its perch to swallow it. A favourite perch of the Roller is a bowrie pole or some leafless tree, whence it can see well all round; also old buildings, a haystack, or other elevated spot; sometimes a low bush or a heap of earth or of stones. When seated it puffs out the feathers of its head and neck. I have on several occasions seen one pursue an insect in the air for some distance, and when the winged termites issue from their nest after rain, the Roller, like almost every other bird, catches them on the wing. It flies in general with a slow but continued flapping of its wings, not unlike the Crow, but more buoyant, but it has the habit of making sudden darts in the air in all directions. Its food is chiefly large insects, grasshoppers, crickets, mantidæ, and even beetles, occasionally a small field-mouse or shrew." Colonel Legge, writing about its habits as observed by him in Ceylon, says that it is "found in open compounds, cocoanut-groves, tobacco-fields, waste scrubby land, grass-fields near the borders of tanks, and also newly cleared spaces in the forest. It perches on some bare tree, fence, or other prominent object, and sallies out after insects, which it captures cleverly on the wing, either returning to its original post or taking up another close by to devour its quarry. It is fond of perching on cocoanut-fronds, and in the Jaffna district often selects the lofty well-whips used to draw the water for irrigating the native tobacco, and presents a striking appearance with its head drawn into its shoulders and its bright plumage glistening in the sun. It is generally difficult of approach, flying from one fence or stump to another before one can get within shot of it; and when fired at, if not hit, flies off, mounting above the tree-tops and rolling from side to side in its course as if it had a difficulty in balancing itself on the wing. However much it is alarmed it generally returns to the field from which it has been chased, making a wide detour and reappearing perhaps on the opposite end from that at which it left. When the ripe paddy has been cut in the fields round the village tanks the Roller is sure to be seen taking his part in the harvest-making, which consists in consuming as many of the newly-exposed terrestrial insects as it can, and flying in the meanwhile from one haycock to the other. Grasshoppers and beetles at such times form its chief diet. Its harsh cry is often uttered when it has been shot at and wounded, it being one of the few birds I have ever met possessed of this singular habit. Its flight is performed with vigorous flappings of the wings, the points of which appear almost to meet beneath its body, while it turns or rolls about in that strange manner which has acquired for it its peculiar name. It varies its course in the air by darting off sometimes at right angles to the original direction and then almost tumbling over in rapidly descending to the ground. These extraordinary evolutions it performs to some purpose when flown at by the Turumti, or Red-headed Merlin." Mr. Holdsworth also remarks that when perched its head is sunk on its shoulders, giving the bird a remarkably clumsy appearance, as is also the case with the Bee-eaters when not on the wing.

Dr. Jerdon says that this Roller "is sacred to Siva who assumed its form; and at the feast of the Dasserah, at Nagpore, one or more used to be liberated by the Rajah, amongst the firing of cannon and musketry at a grand parade attended by all the officers of the station. Buchanan Hamilton also states that before the Durga Puja the Hindoos of Calcutta purchased one of these birds, and, at the time when they throw the image of Durga into the river, set the Nilkant (Roller) at liberty. It is considered propitious to see it on this day, and those who cannot afford to buy one discharge their matchlocks to put it on the wing. The Telugu name of this Roller signifying Milk-bird is given

because it is supposed that when a cow gives little milk, if a few of the feathers of this bird are chopped up and given along with grass to the cow, the quantity will greatly increase. If it should cross a traveller just after starting it is a bad omen." Dr. Jerdon also states that the present species is "often caught by a contrivance called the *Chou-gaddi*. This consists of two thin pieces of cane or bamboo, bent down at right angles to each other to form a semicircle, and tied in the centre. To the middle of this the bait is tied, usually a mole-cricket, sometimes a small field-mouse (*Mus lepidus*); the bait is just allowed tether enough to move about in a small circle. The cane is usually smeared with bird-lime, and it is placed on the ground not far from the tree where the bird is perched. On spying the insect moving about, down swoops the Roller, seizes the bait, and on raising its wings to start back one or both are certain to be caught by the viscid bird-lime. By means of this very simple contrivance many birds that descend to the ground to capture insects are taken, such as the King Crows (*Dicruri*), Common Shrikes, some Thrushes, Flycatchers, and even the large Kingfisher (*Halcyon*)."

The Indian Roller breeds in holes in trees or walls or under the eaves of roofs, and deposits three or four eggs from January to June. Mr. Cripps says (*l. c.*) that in Eastern Bengal, where it is common and resident, he found on the 3rd March "four fresh pure white eggs of this species. Just at the corner of a ryot's house stood an old date-tree about 20 feet high, whose top had fallen off and the heart of the tree had rotted away for about a foot in depth; in the hole thus made the birds had laid their eggs without forming any lining. I have frequently noticed this bird at the hottest time in the day descend to the ground and sit with outstretched wings in the sun, and remain so for some time."

According to Mr. Hume this Roller "builds in holes in trees, in old walls, in roofs, or under the eaves of bungalows; they sometimes make a good deal of a nest of feathers, grass, &c., especially where the site they choose is not well closed in, but where they build in a small-mouthed hole there is usually a very scanty lining. I have found a nest in a large niche in an old wall, in which the birds had contracted the entrance with masses of tow, vegetable fibre, and old rags, but this is quite exceptional; and again I have taken the eggs from a hole in a siris-tree, in which there was not the smallest lining beyond a few fragments of decayed wood. I have never found more than five eggs in any nest, and four I take to be the normal number."

Mr. F. R. Blewitt says: "I do not know exactly how long they continue breeding, but I have found the eggs in May, June, and a part of July. The nest is built in holes of trees and old walls of buildings; occasionally the Roller even breeds in the roofs of houses (as witnessed by me at Sultanpore). I have personally searched but two nests: the one, in a hole of a tree, had a very peculiar grain-like substance of a deep chocolate-colour, on which the eggs were deposited. The other, in a hole in an old wall, had some coarse and fine grass with feathers of various sorts for the eggs to rest on. The regular number of eggs is four. In colour they are white, without any trace of spots, and their average length is 1.3 inch, breadth 1.1 inch. In shape they are oval."

Mr. R. M. Adam remarks that in the neighbourhood of the Sambhur Lake this species is "very common. I have taken its eggs during March, April, and May. On the 24th April I saw a pair making love near the Sambhur Fort, and on the 1st May I obtained the eggs of the same birds from a cavity in a neem-tree; one of the eggs was a little set. Breeds in Oudh during April. On the 19th April I had five eggs brought from one nest." Mr. Rhodes W. Morgan, to whom I am indebted for a large series of the eggs of this Roller, states that in Southern India it "breeds in March, nesting in holes of trees. The tamarind and banyan are generally chosen for this purpose. The eggs are usually two in number and of a pure and glossy white. There is no nest. In size the eggs average 1.39 inch in

length by 1·13 in breadth." In Ceylon, according to Legge, it breeds from January to June. The eggs of this Roller, of which, as above stated, I have a large series, closely resemble those of the common European Roller.

The specimens figured and described are in my own collection.

In the preparation of the above article I have, besides the rich series in the British Museum, examined the following specimens:—

E Mus. Palæarct. H. E. Dresser.

a, ♂ ad.; *b*, ♀ ad.; *c*, juv. Southern India.

E Mus. H. E. Dresser.

a, ♂ ad. Fitalyah, 15th March, 1881 (*W. Davison*). *b*, ♀ juv. Sikkim Terai, 3rd September, 1880 (*W. Davison*).
c, ♂. Seegore, foot of Nilgiris, 12th March, 1885 (*W. Davison*). *d*, *e*. Southern India (*J. Backhouse*).
f, ♂. Gurdara, 4th February, 1881 (*W. Davison*).

E Mus. Cantab.

a, ad. Muckton, near Louth, Lincolnshire, 27th October, 1883 (*J. Cordeaux*).

E Mus. H. Seebohm.

a, ♂ ad. Muddapur, 19th June, 1880. *b*, ♀. Pokeraon, 1st January, 1877. *c*, ♂. Naramolla, Ceylon, 17th October, 1876 (*Col. Legge*). *d*, ♀ ad. Pokeraon, Futtegurh, 2nd January, 1877.

E Mus. H. B. Tristram.

a. India (*T. C. Jerdon*). *b*, ♂. Umballah, India, November 1866 (*R. C. Beavan*). *c*. Muddapur, 20th November, 1880 (*W. E. Brooks*). *d*. Madras (*J. W. Wedderburn*). *e*. Masulipatam, February 1888 (*H. E. Fox*).



J.G.Keulemans lith

BURMESE ROLLER .
CORACIAS AFFINIS.

CORACIAS AFFINIS.

BURMESE ROLLER.

Coracias affinis, McClelland, P. Z. S. 1839, p. 164; Gray, Gen. of B. i. p. 62, pl. xxi. (1845); Blyth, J. As. Soc. Beng. xiv. pt. i. p. 190 (1845); id. Cat. B. Mus. As. Soc. p. 51 (1849); Reichenb. Meropinae, p. 50, pl. 434. fig. 3186 (1852); Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 574 (1856); Gould, P. Z. S. 1859, pp. 150, 151; id. B. of Asia, pt. xxi. (1869); Jerdon, B. of Ind. i. p. 217 (1862); H. Schomb. Ibis, 1864, p. 246; Schlegel, Mus. Pays-Bas, *Coraces*, p. 136 (1867); Bulger, Ibis, 1869, p. 155; Beavan, tom. cit. p. 408; Cab. & Heine, Mus. Hein. ii. p. 118 (1869); Gray, Hand-l. of B. i. p. 76, no. 901 (1869); Blanford, Ibis, 1870, p. 465; Godwin-Aust. Journ. As. Soc. Beng. xxxix. p. 95 (1870); Blyth & Wald. Cat. Mamm. & B. Burmah, p. 72 (1875); Hume, Stray Feath. iii. p. 50 (1875); Armstrong, op. cit. iv. p. 305 (1876); Hume, op. cit. v. p. 18 (1877); Oates, op. cit. v. p. 143 (1877); Hume & Davison, op. cit. vi. p. 72 (1878); Oates, op. cit. vii. p. 40 (1878); Anderson, Yunnan Exped. p. 581 (1878); Tiraut, Ois. Cochin Chine, p. 99 (1879); Hume, Str. Feath. viii. p. 85 (1879); Brooks, tom. cit. p. 467 (1879); Salvin, Cat. Strickl. Coll. p. 411 (1882); Oates, Handb. B. Brit. Burmah, ii. p. 69 (1883); Salvad. Ann. Mus. Civ. Gen. (2) iv. p. 589 (1887); Hume, Str. Feath. xi. p. 48 (1888); Sharpe, P. Z. S. 1890, p. 548; Oates, ed. Hume's Nests & Eggs Ind. B. iii. p. 56 (1890); Sharpe, Cat. B. Brit. Mus. xvii. p. 13 (1892).

Coracias bengalensis (nec Linn.), Bp. Consp. Vol. Anis. p. 7 (1854).

? *Coracias assamensis*, Licht. Nomencl. Av. p. 68 (1854).

Nook Toukah, Siamese.

Figurae notabiles.

Reichenb. Meropinae, pl. 484. fig. 3186; Gould, B. of Asia, part xxi.

HAB. Nepal, eastward to Siam and Cochin China.

Ad. fronte et pileo saturatè cæruleo-viridibus: regione superciliari lætè viridi-cæruleâ: dorso, scapularibus et secundariis intimis saturatè fulvo-viridibus: uropygio cæruleo-viridi: supracaudalibus cæruleis: tectricibus alarum minoribus saturatè ultramarinis, majoribus saturatè viridibus: remigibus ad basin cæruleis, versùs apicem saturatè ultramarinis, primariis quatuor externis cæruleo subterminatis: rectricibus centralibus sordidè viridibus, reliquis saturatè ultramarinis, cæruleo terminatis: gulâ et capitis lateribus purpureo-cæruleis, illâ pallidè cæruleo striatâ: regione paroticâ et pectore purpureo-vinaceis, pectore imo cupreo tincto: abdomine et subcaudalibus viridi-cæruleis: subalaribus saturatè ultramarinis: rostro fusco-nigro: iride fuscâ: pedibus flavo-fuscis.

Juv. capite et corpore suprâ et subtùs cum uropygio, supracaudalibus et tectricibus alarum sordidè fuscis, pallidiore notatis: pileo vix viridi notato: remigibus et rectricibus sicut in adulto, sed pallidioribus et obscurioribus: gulâ pallidè cervino striatâ: subcaudalibus sordidè cæruleis.

Adult male (Sikkim).—Forehead and crown dark bluish green, rather brighter in the superciliary region; back, scapulars, and inner secondaries dull greenish, with a brown tinge; rump deep greenish

blue; upper tail-coverts bright blue; lesser wing-coverts deep ultramarine- or cobalt-blue; greater wing-coverts deep greenish, with a blue tinge; quills at the base light greenish blue, otherwise deep ultramarine-blue; the first four primaries with a subterminal pale blue band; central rectrices dull green, the remainder deep ultramarine-blue, with the terminal portion pale blue; cheeks and throat purplish blue, the latter with lighter blue stripes; ear-coverts, neck, and breast vinous purple, the last with a coppery tinge; abdomen, vent, and under tail-coverts bluish green; under wing-coverts deep ultramarine-blue: bill dark brownish black; gape yellow; edge of the eyelids, lores, and skin at the back of the eye yellowish orange; iris brown; legs yellowish brown. Total length about 13 inches, culmen 1·4, wing 7·8, tail 5·6, tarsus 1·05.

Adult female (Pegu).—Closely resembles the male.

Young (Sikkim).—Upper and underparts generally with the rump, wing-coverts, and upper tail-coverts dull brownish, indistinctly mottled with lighter brown; crown slightly marked with green; wing and tail otherwise as in the adult, but duller in colour; throat with dull buffy-white stripes; under tail-coverts dull light blue.

THE present species ranges from Calcutta eastward to British Burmah, Assam, Siam, and Cochin China. Near Calcutta it meets *Coracias indicus*, and where the ranges of the two species adjoin many hybrids between them occur, and hence there is no doubt that they not unfrequently interbreed; but further east of Calcutta one finds only pure *Coracias affinis*, and west of Calcutta again *Coracias indicus* is met with untainted by any strain of *C. affinis*.

Blyth (J. As. Soc. Beng. xiv. i. p. 190) gives some interesting details respecting the interbreeding of these two Rollers, and Dr. Jerdon writes (*l. c.*) that *C. affinis* “is the only one found to the east of the Bay of Bengal and in Assam, but it spreads into the Sunderbuns, Tipperah, and even the neighbourhood of Calcutta itself, where it mingles and interbreeds with the Indian Roller.” It was met with in Sikkim by Capt. Bulger, who says (Ibis, 1869, p. 155) that a pair was brought to him from the neighbourhood of the Great Rungeet river; and the shikaree informed him that they were very uncommon. Dr. Anderson, who obtained it on the expedition to W. Yunnan, remarks (*l. c.*) that “the two specimens killed at Muangla have the black tips to the tail-feathers much less pronounced than in the other examples. This bird is not at all uncommon in the valley of Sanda, especially in the neighbourhood of the towns and villages, which are generally embosomed in gigantic bamboos and fine trees. I did not observe it beyond Muangla.”

In Burmah this Roller is common. Mr. Blanford records it as occurring at Pegu and Ava. Mr. Armstrong, who met with it on the Irawaddy, remarks that “without being numerous anywhere it was universal in its distribution over the entire district. Wherever there were clumps of trees, bushes, or hedges in open cultivated or waste ground, this species might be seen perching usually upon some dry leafless branch or twig. It was, however, excessively wary, so that it was not always easy to procure specimens.” And Mr. Oates (B. Brit. Burm.) states that “the Burmese Roller, or Blue Jay as it is usually termed by residents in Burmah, occurs commonly over the whole Province, except in the extreme south of Tenasserim, where Mr. Davison did not observe it.” Capt. Beavan procured it at Tonquin in September 1865, Sir H. Schomburgk records it from Siam, and Dr. Tiraut states that it is very common in Cochin China.

According to Dr. Jerdon, the Burmese Roller does not differ in its habits from *C. indicus*; and Mr. Oates, writing on its habits as observed by him in British Burmah, says that it frequents in preference "compounds, gardens, and places where the trees are not very thickly placed. Perched usually on a dead branch, it likes to have a good view all round, in order the more easily to detect the larger insects, which it catches by gliding to the ground. After killing and eating its prey, it returns to the same or a similar perch." Sir H. Schomburgk says that at Bangkok in Siam, where this Roller frequents the gardens attached to the houses, it is subjected to great persecution on the part of the Crows, and that "scarcely have the Crows in the precincts discovered one, when they make a simultaneous attack upon him. The Roller endeavours to avoid them, now by making gyrations in the air, now by alighting upon the branches of some tree, uttering all the time pitiful cries, nor are his tormentors satisfied until he leaves the grounds. The beautiful blue wing-feathers of this bird, principally the primaries and scapularies, are exported to China for tiny fans; and such are even manufactured here, but they are not so well made as those that come from China."

Like its allies, the Burmese Roller makes its nest in hollow trees and deposits pure white eggs. Mr. Inglis, who met with it in North-eastern Cachar, says that it breeds in March, April, and May; and Mr. Oates writes respecting its nidification ('Nests and Eggs of Ind. Birds') as follows:—"The eggs, four or five in number, are laid on the bare wood at the bottom of large natural hollows in decayed branches of large trees. The holes selected are generally not less than 20 feet from the ground. The shell is pure white and excessively glossy. My eggs were taken from the 26th March to the 2nd April, and were in all cases either fresh or only slightly incubated. In size they vary from 1.45 to 1.26 inch in length, and from 1.13 to 1.07 in breadth. The average of 12 eggs is 1.37 by 1.09."

As above stated, the present species interbreeds commonly with *Coracias indicus* in districts where the two species meet. I am indebted to Mr. Davison for two very interesting intermediate specimens, one of which, specimen *h* in my collection, is nearly pure *C. affinis*, whereas the other (specimen *i*) much more nearly resembles *C. indicus*; and through Mr. W. E. Brooks I have received two others from Sikkim (specimens *e*, *f*) which are exactly intermediate between these two. In the British Museum there is a very large series, in the Hume collection, showing every gradation between the two species.

The specimens figured and described are in my own collection.

Besides the rich series in the British Museum, I have examined the following specimens:—

E Mus. H. E. Dresser.

a, ♂ ad. Sikkim (*Whitely*). *b*, ♀. Sikkim Terai, 25th May, 1880; *c*, ♀. 26th May, 1881 (*W. Davison*). *d*, ♀ juv. 11th June; *e*, *f*, ♂ (hybrids). 28th October, 1880; *g*. 30th October, 1880, Sikkim Terai (*W. E. Brooks*). *h*, *i*, ♂ (hybrids). Calcutta Bazaar, January 1883 and December 1880 (*W. Davison*). *j*, ♂. Dilkolka, Cachar, 16th March, 1880 (*J. Inglis*). *k*, ♂ ad.; *l*, ♀ ad. 2nd March, 1878, Lower Pegu (*E. W. Oates*). *m*, ♀ ad. Pegu, 24th November, 1880 (*E. W. Oates*).

E Mus. H. Seebohm.

a, ♂ ad. Labharee, 5th January, 1880. *b*. Sikkim. *c*, *d* (hybrids). Darjeeling. *e*. Siam (*Sir R. Schomburgk*).

E Mus. H. B. Tristram.

a. Assam (*C. J. Langlands*). *b*, ♂; *c*, ♀. Sikkim Terai, 12th January, 1880 (*W. E. Brooks*).



J.G. Keulemans lith.

RUFIOUS CROWNED ROLLER.
CORACIAS NÆVIUS.

Hanhart imp.

CORACIAS NÆVIUS.

RUFOUS-CROWNED ROLLER.

Coracias nœvia, Daud. in Traité d'Orn. p. 258 (1800), "Senegal"; Licht. Verz. Doubl. p. 20 (1823); Wagler, Isis, 1829, p. 737; Vieill. Nouv. Dict. xxix. p. 435 (1819); Licht. Nomencl. Av. p. 68 (1850), "Senegal"; Strickl. Proc. Zool. Soc. 1850, p. 216, "Kordofan"; Sharpe, Ibis, 1871, p. 190 (partim), "Africa"; Antin. & Salvad. Viagg. Bogos, p. 63 (1873); Salvad. Ann. Mus. Genov. i. p. 114 (1884); Shelley, Ibis, 1885, p. 399, "Berbera"; Salvad. Ann. Mus. Genov. (2) vi. p. 223 (1888).

Hairy Roller, Latham, Gen. Syn. Suppl. ii. p. 123 (1802?, partim).

Coracias pilosa, Latham, Ind. Orn. Suppl. p. 27 (1801, partim), "Africa"; Vieill. Nouv. Dict. xxix. p. 430 (1819); Gray, Cat. Fissir. Brit. Mus. p. 34 (1848); Bp. Consp. Gen. Av. i. p. 167 (1850, partim); Reichenbach, Meropinae, p. 49, pl. 433. fig. 3184 (1852); Sclater, Contrib. Orn. 1852, p. 124; Hartlaub, Journ. f. Orn. 1854, p. 1 (partim), "Senegambia, Angola"; Horsf. & Moore, Cat. B. Mus. E. I. Co. ii. p. 571 (1856); Hartl. Orn. W.-Afr. p. 30 (1857); Cab. & Heine, Mus. Hein. ii. p. 117 (1860); Antin. Cat. descr. Ucc. p. 27 (1864); Schlegel, Mus. Pays-Bas, *Coraces*, p. 137 (1867, partim); Heuglin, Orn. N.O.-Afr. i. p. 172 (1869), "N.E. Africa"; Antinori, Journ. f. Orn. 1866, p. 206, "Fazoglo, Khartoum"; Heugl. Journ. f. Orn. 1868, p. 320, "N.E. Africa"; Gray, Hand-l. of B. i. p. 75, no. 898 (1869); Blanf. Geol. & Zool. Abyss. p. 319 (1870), "Abyssinia"; Finsch, Trans. Zool. Soc. vii. p. 221 (1870); Hartl. Abh. nat. Ver. Bremen, vii. p. 110 (1881); Hartert, Journ. f. Orn. 1886, p. 592, "Niger."

Le Rollier varié d'Afrique dans son jeune âge, Levaill. Hist. Nat. Roll. et Geais, pl. 29.

Coracias crinita, Shaw, Gen. Zool. vii. pt. 2, p. 401 (1809), "Africa"; Bonap. Consp. Volucr. Anisod. p. 7 (1854).

Galgulus pilosus (Lath.), Vieill. Tabl. Encycl. et Méth. ii. p. 867 (1823); Cab. & Heine, Mus. Hein. ii. p. 117 (1859-60), "Senegambia, Abyssinia."

Coracias nuchalis, Swainson, B. of W. Afr. ii. p. 110 (1837), "West Africa"; Bp. Consp. Volucr. Anisod. p. 7 (1854), "W. Africa"; Gray, Gen. of B. i. p. 62 (1845), "W. Africa."

Coracias levaillantii, Rüpp. Syst. Uebers. Vög. N.O.-Afr. p. 23 (1845), "Abyssinia"; von Müller, Journ. f. Orn. 1855, p. 5; Heuglin, Syst. Uebers. p. 18 (1856).

Coracias nœvius, Daud., Salvin, Cat. Strickl. Coll. p. 411 (1882, partim), "Kordofan, Damaraland"; Sharpe, Cat. B. Brit. Mus. xvii. p. 24.

Figura unica.

Levaillant, Hist. Nat. Roll. et Geais, pl. 29.

HAB. North-eastern Africa, down to the Equator and Senegambia, and the Niger on the western side of the continent.

♂ *ad.* suprâ olivaceus vinaceo tinctus, pileo et collo postico lilacino-rubris: fronte, superciliis et nuchæ maculâ transversali albis: uropygio lilacino-ultramarino: supracaudalibus magis lilacinis: remigibus saturatè ultramarinis, in pogonio externo nigro marginatis et nigro apicatis: tectricibus alarum violaceo-vinaceis, regione cubitali saturatè lilacinâ: flexurâ, margine alari et alâ spurîâ ultramarinis: rectricibus centralibus nigricantibus viridi tinctis, reliquis ultramarinis, in pogonio interno nigro marginatis: mento albido: corpore subtùs

cervino-rubro albido striato: abdomine imo et subcaudalibus lilacino lavatis: rostro nigricante: pedibus pallide flavo-olivaceis: iride fuscâ.

♀ *ad.* mari similis.

Adult male (Bogos, Abyssinia).—Crown clear reddish lilac; forehead, a stripe over the eye, and nuchal patch white; back olivaceous, slightly varied with lilac; rump lilac-blue; upper tail-coverts deep blue; wing-coverts reddish lilac; the smaller coverts near the carpus and the bastard-wing deep blue; quills deep blue, margined internally and tipped with black; the inner secondaries and larger coverts externally buffy olivaceous; central rectrices dull greenish black; the remaining tail-feathers deep blue, margined with black on the inner web; chin white; underparts generally buffy red, washed with lilac and streaked with white; the lower abdomen more deeply washed with lilac; under tail-coverts pale lilac; under wing-coverts pale whitish buff, tinged with lilac: bill black; legs pale yellowish olive; iris brown. Total length about 12 inches, culmen 1·6, wing 7·0, tail 5·5, tarsus 0·95.

Adult female (Dinki, 29th October).—Resembles the male in general coloration. Total length about 12 inches, culmen 1·6, wing 6·9, tail 5·6, tarsus 0·95.

Young (*fide* Sharpe).—Forehead, eyebrow, and nuchal patch very distinct; upper surface of body olive-green; wing-coverts as in the adult, but more mixed with reddish brown; quills as in the adult, but the inner secondaries more decided olive-green; middle of back dull reddish brown; tail for the most part ultramarine; all the feathers edged with olive-green, except the two middle ones, which are entirely of this colour; under surface of body dull greyish brown, becoming reddish on the flanks, all the white stripes very broad and distinct and having a very slight greenish lustre. Total length 11·5 inches, culmen 1·3, wing 7, tail 5·5, tarsus 0·8.

THE present species, easily distinguishable from its southern ally in having the crown rufous and not olivaceous, inhabits Africa north of the Equator, being found from the eastern to the western side of the continent.

Mr. Blanford, who met with it in the highlands of Abyssinia, says that it was much rarer than *Coracias abyssinicus*: he only saw it twice and failed to procure a specimen; it abounded, however, he adds, in the subtropical region of the Anseba. Von Heuglin observed it “in the coast-regions in the warmer portions of Abyssinia, Kordofan, and on the White Nile, where it chiefly frequents wooded districts. It is much rarer than *Coracias habessinica* and leads a more silent, lonely life than its allies.” Rüppell also records it as common in the lowlands of Abyssinia; and Mr. Lort Phillips, who first met with it twenty miles south of Berbera on his journey to Somaliland, says that it was afterwards fairly plentiful, being generally found near water. Antinori and Salvadori state that some arrive in the Bogos country in March and more in April and May; it was found chiefly near mountains, and feeds on coleoptera and locusts. Antinori speaks of it as being rare in North-Central Africa; he met with a pair at Roseres, and shot the female: he observed another in the vicinity of Fazoglo, but could not procure it. It is a very shy bird and has very keen sight.

A young male killed near Khartoum in the month of July was given to Dr. Antinori by Dr. Ori,

the chief physician of the Soudan. That it occurs in Equatorial Africa is evident from a specimen in the British Museum, which was obtained by Emin Pasha at Muggi on the 28th of October.

On the western side of the African continent it is found in Senegambia; and Hartert, who observed it on the Niger in the Benue district, says that it was only seen on a few occasions at Keffi and Saria. How far south, however, it ranges on the West Coast I cannot say, as the records of its occurrence in that part of Africa are very meagre.

Respecting the habits of the present species, I find nothing on record beyond what I have cited above, and its eggs appear to be unknown; but doubtless it nests, like its congeners, in holes in trees and deposits white eggs.

Dr. Sharpe remarks (Cat. B. Brit. Mus. xvii. p. 25) that "the Senegambian birds, true *C. nævius*, are somewhat different from those from North-eastern Africa. They have a slight shade of greyish olive at the end of the feathers of the crown, which is otherwise reddish. I have, however, not seen enough specimens to enable me to judge whether these slight differences are constant, and the bird from the Niger will also require comparison."

To this I may remark that one of the two specimens in the British Museum collection from the Gambia (spec. *l*, River Gambia, *Whitely*) is, I consider, undoubtedly referable to *C. mosambicus*, but, being a dealer's skin and not having the original label, there is probably an error in the locality given.

The specimens figured and described are in my own collection.

In the preparation of the above article I have, besides the series in the British Museum, examined the following specimens:—

E Mus. H. E. Dresser.

a, ♂ ad. Abyssinia (*Gerrard*). *b*, ♂ ad. Farre, N.E. Africa, 4th February, 1886 (*Count T. Salvadori*). *c*, ♀ ad. Dinki, N.E. Africa, 29th October, 1885 (*Count T. Salvadori*).

E Mus. H. B. Tristram.

a. Kordofan, 1842 (*J. Petherick*). *b*. Kikombo, on the road to Uganda, August 1888 (*Dr. S. Tristram-Pruett*). *c*, ♂. Bathurst, Gambia, 1st July, 1889 (*Dr. P. Rendall*).



Hanhart imp.

OLIVE CROWNED ROLLER.
CORACIAS MOSAMBICANUS.

J.G. Keulemans lith.

CORACIAS MOSAMBICUS.

OLIVE-CROWNED ROLLER.

Hairy Roller, Lath. Gen. Synop. Suppl. ii. p. 123 (1802 ?, partim), "Africa."

Coracias pilosa, Lath. Ind. Orn. Suppl. p. 27 (1801, partim), "Africa"; Bp. Consp. Gen. Av. i. p. 167 (1850, partim); Hartlaub, Journ. f. Orn. 1854, p. 1 (partim), "Senegambia, Angola"; Gurney, P. Z. S. 1864, p. 2; Schlegel, Mus. Pays-Bas, *Coraces*, p. 137 (1867, partim); Chapman, Trav. in S. Afr., App. p. 408 (1868), "S. Africa"; Gurney, Ibis, 1868, p. 461, "Natal"; Sharpe, Proc. Zool. Soc. 1869, p. 569, "Angola"; Bocage, J. Ac. Sc. Lisb. v. pp. 35, 50 (1874), "Ambete"; id. Journ. f. Orn. 1876, p. 406, "Angola."

Coracias nuchalis (nec Swainson), Layard, B. of S. Afr. p. 60 (1867), "S. Africa"; Chapman, Trav. in S. Afr., App. p. 408 (1868), "S. Africa."

Coracias nævia (nec Daudin), Dumont, Dict. Sc. Nat. xlv. p. 179 (1827); Sharpe, Ibis, 1871, p. 190; Anders. B. of Damara Land, p. 54 (1872), "Damara Land"; Buckley, Ibis, 1874, p. 363, "Matabili"; Sharpe in Layard's B. of S. Afr. p. 103 (1875), "S. Africa"; Bocage, J. Ac. Sc. Lisb. vi. p. 63 (1877), "Quillengues"; id. op. cit. vi. p. 194 (1878), "Caconda"; Ayres, Ibis, 1879, p. 290, "Transvaal"; Bocage, Orn. d'Angola, p. 83 (1881), "Angola"; Sharpe in Oates' Matabele Land, p. 302 (1881); Shelley, Proc. Zool. Soc. 1881, p. 566, "Dar-es-Salaam"; Ayres, Ibis, 1886, p. 284, "Limpopo"; Symonds, Ibis, 1887, p. 327, "Orange Free State."

Coracias nævius (nec Daudin), Shelley, Ibis, 1882, p. 243, "Matabili"; Salvin, Cat. Strickl. Coll. p. 411 (1882, partim), "Kordofan, Damaraland."

Coracias nævia levaillantii, Shelley, Ibis, 1885, p. 399, "S. Africa."

Coracias mosambicus, Dresser, Ibis, 1890, p. 386.

Coracias olivaceiceps, Sharpe, Cat. B. Brit. Mus. xvii. p. 25 (1892).

"*Coracias mosambica*, Dresser," Sharpe, Cat. B. Brit. Mus. xvii. p. 26, syn. (1892).

Chegala, Matabeli; *Ubiaganga*, *Chobia*, at Caconda; *Ambeta Cicoca*, *Kahanana*, at Humbe; *Hohobia*, or *Soba*, i. e. Chief (Anchieta).

Figura nulla.

HAB. East Africa, from the Orange Free State to at least 6° S. lat.; West Africa, from Togoland down to South Africa.

Ad. C. nævio similis, sed pileo olivaceo nec rufescente, corpore suprâ magis viridi-olivaceo, et gulâ, gutture cum pectore magis pupureo lavatis.

Adult male (Zambesi).—Resembles *Coracias nævius*, but has the crown olivaceous, not red; the upper parts of a somewhat darker greenish-olivaceous tinge, and the throat and breast washed with purple, these parts being therefore darker than in *C. nævius*: bill black; feet dull greenish yellow; iris ashy brown. Total length about 4·5 inches, culmen 1·6, wing 7·3, tail 6·0, tarsus 1·0.

Adult female.—Similar to the male, but a trifle smaller in size.

Young (Ondonga).—Resembles the adult, but is much duller and paler in coloration; underparts without the rich lilac tinge; crown green as in the adult but paler.

Obs.—According to Anchieta the feet are yellowish grey and the iris coffee-brown, whereas according to Ayres the feet are dull greenish yellow and the iris ashy brown.

THE present species is the southern representative of *Coracias naevius*, and is found probably from the Equator down to the Cape Colony. Dr. A. Reichenow informs me that they have this species from Gouda (south of Tabora in the Uganda district, in about 6° S. lat.) in the Berlin Museum, and Captain Shelley (P. Z. S. 1881, p. 566) records a Roller under the name of *C. naevia* from Dar-es-Salaam, which I believe to belong to the present species, though I have not had an opportunity of examining this specimen.

Mr. Oates records it from the Zambesi district, and he obtained it at the first and second Makalaka kraals. Dr. Exton procured it at Kanye, Mr. Ayres records it from the Limpopo river, Jameson obtained it at Bamangwato in the Matabeli country in May, where, according to Captain Shelley (Ibis, 1882, p. 243), it was “met with singly or in pairs, and, although by no means common up country, is very generally distributed. There were several around our camp at the Umvuli river, mostly in pairs, while those we met with on the road were single.” Mr. T. E. Buckley obtained it at Matabeli in October, and says that it was fairly common and generally seen singly or in pairs, and he also records it from the Transvaal, where, however, according to Mr. Ayres, it was much scarcer than *C. caudatus*. According to Mr. Reid it is not unfrequent between Soutpans Drift, Orange river, and Gugua town; Mr. Ayres records it as being not uncommon during the summer in Natal; and Mr. Symonds states (Ibis, 1887, p. 327) that “a specimen was shot in the bush by the river about five miles from Kroonstad, Orange Free State, and is the only one I have seen there. When first killed it had a beautiful shining appearance, like shot silk, somewhat of a green and blue colour, but this subsequently faded; the head is crested.” According to Layard (*l. c.*), “Levaillant procured this bird in Kaffraria. I have received it from the neighbourhood of Otjimbingue in Damaraland, and one specimen was shot near Middleburg on the eastern side of the colony, and sent to me by the late Mr. J. O'Reilly, magistrate of that place.”

On the western side of the continent it is found as far north as Togoland. Andersson says that it is not uncommon throughout Damaraland, and is also found in the Lake Regions. Monteiro records it from Ambriz, Anchieta from Capangombe, Huilla, Humbe, and the Rio Cunene, and Bocage from Quillengues and Caconda, and, according to Dr. Reichenow, it was obtained by Dr. Büttner at Bismarcksburg in Togoland. I must, however, here state that Dr. Reichenow does not believe in the specific value of the present Roller, for he writes to me as follows:—“I hold that *Coracias mosambicus* (*olivaceiceps*, Sharpe) is merely the immature of *C. naevius*. I have both forms (*naevius* and *mosambicus*) from Gouda, south of Tabora in the Uganda district, East Africa, where Boehm obtained them at the same time. The specimen coloured like *C. mosambicus* is certainly a young bird. Furthermore, I have the two forms from Bismarcksburg in Togoland, West Africa, both shot on the same day by Dr. Büttner. The specimen coloured like *C. mosambicus* is an older bird; the throat and sides of the head are coloured like the under surface of the body, and there is merely

a greenish tinge on the centre of the throat; the crown is not pure greenish like the back, but tinged with reddish, the bases of the feathers being washed with reddish. I believe the size of the bill to be an individual difference." I cannot coincide with this view, as I have before me fully adult specimens which have the crown green, and all the specimens I have seen from South Africa have, without exception, the crown green, those from Abyssinia and North Africa having the crown reddish; besides, in the British Museum are immature birds of both forms, those of *C. nœvius* having the crown decidedly red like the adults, and those of *C. mosambicus* having the crown decidedly green, though paler than in the adult bird.

It is, however, very possible that, where the two species meet, they may interbreed and produce intermediate forms, as is the case with *Coracias indicus* and *C. affinis*, where the ranges of these two species intergrade.

Referring to the habits of this Roller as observed by him in Damaraland, Mr. Andersson writes (*l. c.*):—"It is usually met with in pairs, and is not particularly shy. It seldom extends its flight far, but occasionally rises to a considerable height, rocking violently to and fro, and descending in a similar manner, with a motion resembling that of a boy's kite when falling to the ground on the guiding force being withdrawn. When on the wing it makes a great noise, rapidly uttering harsh and discordant sounds; its notes are at times not unlike the sound produced by a broad-bladed knife passing through a tough piece of cork, but are in a louder key. This species seeks much of its food on the ground; but sometimes it watches from some elevated position, and, the moment its prey comes within sight, darts upon it with unerring certainty, its habit in this respect being very like that of the Butcher-bird Shrikes. It is a most useful bird, feeding largely on centipedes, scorpions, tarantulas, and other insects, as well as on small snakes and lizards."

In Natal, according to Mr. Ayres, this Roller "is generally found either solitary or in pairs. The young birds may be readily reared, as they feed well on raw meat or insects; but they are troublesome from the loud discordant notes which they almost always utter. They give their food a toss before swallowing it, and, in fact, toss it down their throats." He also adds that it is said to become more plentiful in that district towards the summer months.

The various observers agree in stating that the present species, like its congeners, nests in holes in trees and deposits pure white eggs. This Roller is, Mr. Andersson writes (*l. c.*), "one of the earliest breeders in Damara Land, and makes its nest in the hollows of trees, usually such as have been previously occupied by some Woodpecker: the stems of these trees are mostly tall and straight; and in consequence of this, and of the smallness of the apertures, the nests are very inaccessible. I have frequently seen such breeding-places without being able to reach them; but I believe the eggs are white and two in number, and that both parents assist in their incubation." This view as to the colour of the eggs is confirmed by Mr. Chapman, who further states, in his 'Travels in South Africa,' that "these birds before they are fledged, as well as the hen while breeding, are fed by the male bird; the hen never leaves the nest until the brood are fledged. The birds cannot fly well, and if seen in an open field, where an occasional resting-place is not to be found, are easily run down and eaten by the Bushmen." According to Anchieta this Roller nests in the trunks of trees and its note resembles the words "*Háa, Háa.*"

Until 1885 the present species and *Coracias nœvius* were considered to be specifically identical, and to Captain Shelley is due the credit of having first pointed out the distinctive characters of the two species (*Ibis*, 1885, p. 399); but he then recognized the southern form merely as a subspecies, calling it *Coracias nœvia levaillantii*. Early in the same year I had occasion to examine the series in the British Museum, and I then noticed differences, which I considered specific, between the

northern and southern forms, ascertaining on working out the synonymy that the northern form would stand as *Coracias naevius*, but that the southern had no name. I then had both figured for the present work, and, though I did not publish the results at which I had arrived, I gave the southern form the name of *Coracias mosambicanus*, which name was in June 1885 (as I find on reference to the lithographer's account) printed on the plate of the present species. In 1890, however, I thought it advisable to publish the information I had collected five years previously, and to fix the name, which I did (*Ibis*, 1890, p. 385); but I then found it necessary to alter the specific name to *mosambicus*, which name I contend is the one that will stand. Dr. Sharpe, however, in the recently published volume of the 'Catalogue of the Birds in the British Museum' (xvii. p. 25, note) has deemed it advisable to rename the species on the plea that "for the last twelve months" (which would be from early in 1891) "the name of *C. olivaceiceps* has been attached to the South-African form of *C. naevius* in the MSS. of the present volume of the Catalogue," and further, because there is, he says, no proof forthcoming of the occurrence of this Roller in Mozambique. As regards the former contention there is no doubt of my having named the bird in 1885, fully six years before Dr. Sharpe took any steps in the matter, and, furthermore, my name was published two years before that given by him, while I have a list of the specimens in the British Museum of those which have the crown red and those with the crown green, compiled for me by Dr. Sharpe when I was working out the question at the British Museum in 1885. As regards his contention that there is no proof of the occurrence of this form in Mozambique, this will not stand good, as not only has the bird been procured on the Zambesi, which forms the southern boundary of Mozambique, but it has been also obtained as far north as 6° S. lat., so that its range extends north of Mozambique. It appears somewhat strange that Dr. Sharpe should have overlooked the specimens in the Berlin Museum from Gouda and Togoland, for he states that on a recent visit to Berlin he together with Dr. Reichenow examined the Rollers at that Museum.

In any case, had Dr. Sharpe been correct in his assertion that the present species does not range as far north as into Mozambique, he should have been the last person to find fault with the name I gave it, as he himself at the same time, in 1890 (*Cat. B. Brit. Mus.* xiii. p. 645), gave the name of *Ammomanes algeriensis* to a Lark which (*fide* Tristram) has never occurred in Algeria proper, and does not range north of the Sahara. Had, therefore, Dr. Sharpe been justified in the course he took I should be equally justified in renaming his species and calling it *Ammomanes saharæ*.

The specimen figured and described is the type and is in my own collection, as is also the young bird described.

In the preparation of the above article I have examined, besides the series in the British Museum, the following specimens:—

E Mus. H. E. Dresser.

a, ♂ ad. Zambesi (*Bradshaw*). *b*, ♀ ad. East Africa (*Whitely*). *c*, juv. Ondonga, Damaraland, 11th January, 1867 (*Andersson*).

E Mus. H. B. Tristram.

a, ♂. S. Africa (*Sir A. Smith*). *b*. Damaraland, 1852 (*C. J. Andersson*). *c*, ♂. The Reeds, Swakop river, S. Africa, 13th April, 1865 (*C. J. Andersson*). *d*, ♀. Kroonstad, Orange Free State, 6th June, 1885 (*E. F. Symonds*).



BLUEBELLIED ROLLER.
CORACIAS CYANOASTER.

Hanhart imp.

CORACIAS CYANOCASTER.

BLUE-BELLIED ROLLER.

Le Rollier à ventre bleu, Levaill. Hist. Nat. Rolliers et Geais, i. no. 26 (1806).

Coracias cyanogaster, Cuvier, Règne Animal, i. p. 401 (1817, ex Levaill.) ; Steph. in Shaw's Gen. Zool. xiv. p. 71 (1826) ; Wagler, Syst. Av., *Coracias*, no. 6 (1827) ; Dumont, Dict. Sc. Nat. xlv. p. 182 (1827) ; Lesson, Man. d'Orn. i. p. 400 (1828) ; id. Traité d'Orn. p. 355 (1831) ; Jardine & Selby, Ill. Orn. iii. pl. 123 (1835) ; Swainson, B. of W. Afr. ii. p. 108, pl. 13 (1837) ; Gray, Gen. of B. i. p. 62 (1845) ; id. Cat. Fissir. Brit. Mus. p. 34 (1848) ; Bp. Consp. Gen. Av. i. p. 167 (1850) ; Hartl. Beitr. Orn. Westafr. p. 17 (1852) ; id. Journ. f. Orn. 1854, p. 1 ; Licht. Nomencl. Av. p. 68 (1854) ; von Müller, Journ. f. Orn. 1855, p. 6 ; Hartl. Orn. Westafr. p. 30 (1857) ; Cabanis & Heine, Mus. Hein. ii. p. 116 (1859-60) ; Schlegel, Mus. Pays-Bas, *Coraces*, p. 136 (1867) ; Bocage, Journ. Ac. Sc. Lisb. 1867, p. 133.

Garrulus cyanogaster (Cuv.), Vieill. Nouv. Dict. xxix. p. 436 (1819) ; Sharpe, Cat. B. Brit. Mus. xvii. p. 27 (1892).

Galgulus cyanogaster (Cuv.), Vieill. Tabl. Encycl. et Méthod. ii. p. 870 (1823).

Coracias cyanogastra (Cuv.), Reichenbach, Meropinae, p. 48, pl. 432. figs. 3183, 3184 (1852) ; Hartlaub, Journ. f. Orn. 1861, p. 104 ; Sharpe, Ibis, 1871, p. 203 ; Bocage, Journ. f. Orn. 1876, p. 435.

Coraciura cyanogastra (Cuv.), Bp. Consp. Volucr. Anis. p. 7 (1854) ; Gray, Hand-l. of B. i. p. 76, no. 903 (1869).

Figurae notabiles.

Levaillant, Hist. Nat. Rolliers et Geais, i. no. 26 ; Jardine & Selby, Ill. Orn. iii. pl. 123 ; Swainson, B. of W. Afr. ii. pl. 13 ; Reichenb. Meropinae, pl. 432. figs. 3183, 3184.

HAB. Senegambia.

♂ *ad.* capite, collo, pectore et dorso antico rufescenti-cervino, pileo vix nigricante angustè striato : dorso reliquo, scapularibus et secundariis intimis viridi-fuliginosis : uropygio, supra- et subcaudalibus, cum abdomine et tectricibus alarum superioribus, saturatè ultramarinis : caudâ saturatè cæruleo-viridi, rectricibus extimis elongatis et attenuatis, in parte apicali nigris : remigibus ad basin turcinis, in parte apicali saturatè ultramarinis, in pogonio interno nigro marginatis : subalaribus turcinis : rostro et pedibus nigris : iride fuscâ.

♀ *ad.* mari similis.

Adult male (Gambia).—Head, neck, breast, and fore part of the back warm rufescent buff, the crown marked with fine blackish lines ; rest of the back, scapulars, and innermost secondaries greenish black ; rump, upper tail-coverts, and upper wing-coverts, and rest of the underparts deep rich ultramarine-blue ; tail deep bluish green, the outer rectrix on each side elongated and much attenuated, the terminal portion of the feathers black ; quills turquoise-blue on the basal portion,

otherwise rich deep ultramarine-blue, margined with black on the inner webs; under wing-coverts and a narrow line along the shoulder turquoise-blue: bill and legs black; iris dark brown. Total length about 13 inches, culmen 1·5, wing 7·5, tail 7·2, tarsus 1·15; the outer rectrix on each side extending 2·3 beyond the rest.

Adult female.—Resembles the male.

THE Blue-bellied Roller is a resident species in Western Africa, where its range appears to be confined to the district of Senegambia. Beaudouin obtained it in the Bissao district and Verreaux records it from Casamanze; and I may add that, according to Professor Barboza du Bocage, the Lisbon Museum contains a specimen which is stated to have come from the Cape Verd Islands; but if it actually was obtained there, it must have been an accidental straggler, probably driven out of its course by stress of weather, for the ornithologists who have written on the natural history of those islands do not mention the occurrence of a Roller there, and hence it is far from improbable that some mistake has been made in the record of the locality whence the specimen in question was obtained.

Judging from the number of these birds which have been sent from Senegambia, the present species is probably by no means uncommon there; but although it is nearly a century since this Roller was first discovered, it is somewhat remarkable that so little is on record respecting its range, and absolutely nothing has been published respecting its habits and nidification. In all probability it makes its nest, like its congeners, in the hollow of a tree and deposits white eggs.

The specimen figured and described is from the River Gambia, and is in my own collection.

In the preparation of the above article I have, besides the series in the British Museum, examined the following specimens:—

E Mus. H. E. Dresser.

a, ad. River Gambia (*Whitely*). *b*, ♂ ad. Senegambia (*Boucard*).

E Mus. H. B. Tristram.

a. Bathurst, Gambia, 1888 (*Dr. P. Rendall*).

E Mus. W. Rothschild.

a, ♂ ad. Upper Casamanze, Senegambia.



J.G. Keulemans lith.

Hanhart imp

TEMMINCKS ROLLER.
CORACIAS TEMMINCKII.

CORACIAS TEMMINCKI.

TEMMINCK'S ROLLER.

Le Rollier Temminck, Levaill. Hist. Nat. Rolliers et Geais, iii. Suppl. p. 46. fig. G (1806).

Garrulus temminckii, Vieillot, Nouv. Dict. xxix. p. 435 (1819).

Galgulus temmincki, Vieillot, Tabl. Encycl. et Méthod. ii. p. 869 (1823).

Coracias temminckii (Vieill.), Wagler, Syst. Av., *Coracias*, no. 5 (1827); Dumont, Dict. Sc. Nat. xlv. p. 183 (1827); Gray, Gen. of B. i. p. 62 (1845); Bp. Consp. Gen. Av. i. p. 167 (1850); Reichenb. Meropinae, p. 51 (1852); Lichtenstein, Nomencl. Av. p. 68 (1854); Selater, Proc. Linn. Soc. ii. p. 155 (1858); G. R. Gray, Proc. Zool. Soc. 1858, p. 189; id. Cat. B. of New Guinea, pp. 18, 54 (1859); Cab. & Heine, Mus. Hein. ii. p. 118 (1859-60); G. R. Gray, Proc. Zool. Soc. 1861, p. 433; Wallace, Ibis, 1864, p. 41; Finsch, Neu-Guinea, p. 160 (1865); Schlegel, Mus. Pays-Bas, *Coraces*, p. 138 (1867); Gray, Hand-l. of B. i. p. 75, no. 899 (1869); Gould, B. of Asia, pt. xxi. (1869); Wallace, Malay Archipelago, i. p. 273 (1869); Walden, Trans. Zool. Soc. viii. p. 433 (1872); A. B. Meyer, Ibis, 1879, p. 59; Salvadori, Orn. Papuas. i. p. 512 (1880); Guillemard, Proc. Zool. Soc. 1885, p. 546; Blasius, Zeitschr. ges. Orn. ii. p. 242 (1885), iii. p. 88 (1886); Sharpe, Cat. B. Brit. Mus. xvii. p. 26 (1892).

Coracias papuensis, Quoy & Gaimard, Voy. de l'Astrolabe, Zool. i. p. 221 (1830); Beccari, Ibis, 1876, p. 247.

Rollier d'Urville, Quoy & Gaimard, op. cit. Atlas, pl. 16.

Coracias (Galgulus) temminckii (Vieill.), Reichenbach, Meropinae, p. 51 (1852).

Coracias pileata, Blyth, Cat. B. Mus. As. Soc. p. 50 (1849); Bp. Consp. Volucr. Anisod. p. 7 (1854).

Eurystomus pileatus (Blyth), Gray, P. Z. S. 1860, p. 316.

Malayan *Kapala-biru*, i. e. Blue-bird; Alfuros name of the Minahassa *Patch-rokos* (fide Meyer), *Tonkaka* (fide Guillemard).

Figurae notabiles.

Quoy & Gaimard, Voy. de l'Astrolabe, pl. 16; Reichenbach, Meropinae, pl. 434. fig. 3187; Gould, B. of Asia, part xxi.

HAB. Celebes.

Ad. pileo turcino-cæruleo viridi tincto: nuchâ, collo postico, capitis lateribus, mento et corpore subtus nigricanti-cæruleis ultramarino tinctis: dorso scapularibus et secundariis intimis saturatè viridis olivaceo tinctis: uropygio ultramarino: supracaudalibus turcino-cæruleis: alis et caudâ saturatè ultramarinis, primariis in pogonio interno nigro marginatis: gulâ ultramarinâ pallidiore striatâ: crisso et subcaudalibus saturatè ultramarinis: rostro nigro: pedibus nigro-fuscis: iride fuscâ.

Juv. sordidior: pileo pallidiore: corpore subtus fumoso-nigro, abdomine ultramarino lavato: gulâ, gutture et pectore albido striatis.

Adult male (Celebes).—Crown pale turquoise-blue tinged with green; nape, hind neck, sides of the head and neck, and entire underparts blackish blue tinged with rich ultramarine; lower neck,

back, scapulars, and innermost secondaries deep green with an olivaceous tinge; rump deep ultramarine; upper tail-coverts turquoise-blue; wings and tail deep rich ultramarine-blue, the wings brighter on the lesser coverts, most of the quills margined with black on the inner web; ear-coverts nearly black; neck nearly ultramarine-blue striped with lighter blue; crissum and under tail-coverts rich ultramarine-blue: bill black; iris deep brown; legs blackish brown. Total length about 12 inches, culmen 1.75, wing 7.5, tail 5.5, tarsus 1.05.

Adult female (Celebes).—Resembles the male, but is rather less brilliant in tone of colour.

Young (N. Celebes).—Differs from the adult in being duller in colour; crown of a much paler and duller blue; underparts sooty blackish, with only a faint blue wash on the abdomen; throat and breast striped with dull bluish white.

TEMMINCK'S or the Blue-headed Roller inhabits the Malay Archipelago, and is said to have been met with in New Guinea; but this is denied by Salvadori, who states that no species of *Coracias* inhabits that island, and that Quoy and Gaimard are wrong in saying that it inhabits the harbour of Dorey, and this opinion is confirmed by Beccari. Dr. A. B. Meyer met with it near Menado in June, and at Limbotto in July 1871. Gray in his 'Hand-list' gives its habitat as the Sula Islands and Celebes, and I have examined many specimens from the latter locality; Wallace records it from Macassar, Forsten from Kema, Guillemard from Kema and Menado, and von Rosenberg from Kema, Gorontalo, and Modelido.

With regard to its habits, Dr. Meyer says that "it usually flies singly, but after feeding several play together. They frequently sit on dead twigs and look out for grasshoppers and other insects; then suddenly rushing upon their prey they return to their perch." Wallace, however, writes that "they generally go in pairs, flying from tree to tree, and exhibiting while at rest that all-in-a-heap appearance and jerking motion of the head and tail which are so characteristic of the great Fissirostral group to which it belongs." Wallace remarks that it has a most discordant voice, and Dr. Meyer describes its note as *tschirrrrr*.

So far as I can ascertain nothing has been recorded respecting the breeding-habits and nidification of this Roller, but doubtless, like its congeners, it nests in hollow trees and deposits white eggs.

The adult specimen figured and described is in my own collection, and the young bird described is in the British Museum.

In the preparation of the above article I have, besides the series in the British Museum, examined the following specimens:—

E Mus. H. E. Dresser.

a, ♀. Celebes (*Eyton Collection*). *b*, ♂. Celebes (*Whitely*). *c*, ♂. Celebes (*Warwick; ex Eyton Coll.*).

E Mus. H. B. Tristram.

a. Celebes (*W. W. Saunders*). *b*. N. Celebes (*von Faber*).

GENUS EURYSTOMUS.

Galgulus, Brisson, Orn. ii. p. 63 (1760, partim).

Coracias, Linn. Syst. Nat. i. p. 159 (1766, partim).

Eurystomus, Vieill. Analyse, p. 37 (1816). Type *E. orientalis*.

Colaris, Cuvier, Règ. Anim. i. p. 401 (1817). Type *E. orientalis*.

Cornopio, Cab. & Heine, Mus. Hein. ii. p. 118 (1860). Type *E. afer*.

HAB. Southern part of the Eastern Palæarctic Region, Ethiopian Region, Madagascar, Indo-Malayan Region, Australian Region.

Rostro brevior, lato, maxillâ apice hamatâ: alis longis, acutis, remige secundâ longissimâ: caudâ æquali vel inconspicuè rotundatâ: pedibus brevibus, robustis.

Bill short and broad, hooked, as broad at the base as it is long; nostrils oblique, longish, hidden by the feathers at the base of the upper mandible. Wings long and rather pointed, the second quill longest, the first not much shorter. Tail moderately long, even or slightly rounded; tail-feathers twelve in number. Legs rather short and stout, the feet anisodactyle; the outer toe united to the middle toe at the extreme base, the inner toe united along the basal joint; claws moderately stout, curved, compressed, acute. Sexes similar in coloration.—Type *Eurystomus orientalis*.

THE present genus contains eight species, one of which is found in the southern portion of the Eastern Palæarctic Region, two inhabit the Indo-Malayan Region, a third straggling just within its limits, three are found in the Australian Region, and three inhabit the Ethiopian Region. They are, as a rule, forest-haunting species, frequenting the more open places in large forests, and are generally to be found on tall forest trees. They are not gregarious, but are generally seen in pairs. Their call-note is harsh and unmelodious. They nest in hollows of trees, and deposit their pure white, glossy eggs on the rotten fragments of wood without constructing any nest.



J.G. Keulemans lith.

MADAGASCAR BROADBILLED ROLLER.
EURYSTOMUS CLAUCURUS.

Hanhart imp.

EURYSTOMUS GLAUCURUS.

MADAGASCAR BROAD-BILLED ROLLER.

Le Rollier de Madagascar, Montbeill. Hist. Nat. Ois. iii. p. 148 (1775).

Le Rolle de Madagascar, Daubent. Pl. Enl. iii. pl. 501.

Coracias glaucurus, P. L. S. Müller, Natursyst. Suppl. p. 86 (1776); Cassin, Proc. Philad. Acad. 1864, p. 242.

Madagascar Roller, Latham, Synopsis, i. p. 413 (1781).

Coracias orientalis (nec Linn.), Bodd. Tabl. Pl. Enl. p. 29 (1783).

Coracias madagascariensis, Herm. Tabl. Affin. Anim. p. 197 (1783); Gmel. Syst. Nat. i. p. 379 (1788); Lath. Ind.

Orn. i. p. 170 (1790); Daudin, Traité d'Orn. p. 263 (1800); Shaw, Gen. Zool. vii. pt. 2, p. 404 (1809);

Wagler, Syst. Av., *Coracias*, no. 17 (1827); Lesson, Man. d'Orn. i. p. 401 (1828).

Le Grand Rolle violet, Levaillant, Hist. Nat. Rolliers et Geais, i. p. 96, pl. 34 (1806).

Eurystomus violaceus, Vieill. Nouv. Dict. xxix. p. 426 (1819); id. Tabl. Encycl. et Méthod. ii. p. 872 (1823); von Müller, Journ. f. Orn. 1855, p. 6.

Eurystomus madagascariensis (Gmel.), Steph. in Shaw's Gen. Zool. xiii. pt. 2, p. 97 (1826); Gray, Gen. of B. i. p. 61 (1845); Bp. Consp. Gen. Av. i. p. 168 (1850); Lichtenstein, Nomencl. Av. p. 68 (1854); Bp. Consp. Volucr. Anisod. p. 7 (1854); Hartlaub, Journ. f. Orn. 1860, p. 83; id. Faun. Madag. p. 27 (1861); Roch & Newton, Ibis, 1862, p. 270; E. Newton, Ibis, 1863, pp. 176, 341; Schlegel, Mus. Pays-Bas, *Coraces*, p. 143 (1867); Grand. Rev. et Mag. de Zool. 1867, p. 354; Schleg. & Poll. Faun. Madag., Ois. p. 103 (1868); Finsch & Hartl. Vög. Ost-Afr. p. 151 (1870); Hartlaub, Faun. Madag. p. 67 (1877).

Colaris violaceus (Vieill.), Wagler, Syst. Av., *Colaris*, no. 1 (1827); Lesson, Traité d'Orn. p. 356 (1831); Dumont, Dict. Sc. Nat. xvi. p. 174 (1827).

Colaris madagascariensis (Gmel.), Reichenb. Meropinæ, p. 56, pl. 438. fig. 3200 (1852).

Cornopio madagascariensis (Gmel.), Cab. & Heine, Mus. Hein. ii. p. 119 (1859-60).

Eurystomus (*Cornopio*) *glaucus* (P. L. S. Müll.), G. R. Gray, Hand-l. of B. i. p. 76, no. 910 (1869).

Eurystomus glaucurus (P. L. S. Müll.), Sharpe, Proc. Zool. Soc. 1870, p. 397; id. Ibis, 1871, p. 271; Elliot, Ibis, 1871, p. 204; Bartlett, Proc. Zool. Soc. 1875, p. 65; Shelley, Proc. Zool. Soc. 1879, p. 675; Milne-Edw. & Grand. Hist. Nat. Madag., Ois. i. p. 214, pls. 80, 81, 82 (1879); Sharpe, Cat. B. Brit. Mus. xvii. p. 29 (1892).

Vorooncark, *Tsararakä*, *Voronkähakä*, *Fitilimbaratra*, in Madagascar.

Figuræ notabiles.

D'Aubenton, Pl. Enl. pl. 501; Levaillant, Hist. Nat. Roll. et Geais, pl. 34; Reichenbach, Meropinæ, pl. 428. fig. 3200; Milne-Edw. & Grand. Hist. Nat. Madag., Ois. i. pl. 80.

HAB. Madagascar, Anjuan, and the eastern coast of Africa.

Ad. suprà lætè cinnamomeus, uropygio imo cyaneo lavato: supracaudalibus sordidè ultramarinis: remigibus nigris, in pogonio externo ultramarino lavatis, secundariis intimis lilacino tinctis: caudâ pallidè ultramarino-nigro apicatâ: corpore subtùs pulchrè lilacino: capitis lateribus lilacino lavatis: abdomine imo thalassino lavato et subcaudalibus thalassinis: rostro flavo: pedibus viridi-flavis: iride fuscâ.

Juv. corpore suprâ sordidiore et coloribus obscurioribus : corpore subtùs sordidè thalassino, gulâ lilacino tinctâ : alis et caudâ sordidioribus, hac thalassino lavatâ : rostro apice et culmine nigricantibus.

Adult male (Madagascar).—Upper parts rich bright cinnamon ; lower rump washed with cobalt-blue, and the upper tail-coverts dull cobalt ; quills black on the outer webs, washed with ultramarine-blue, the inner secondaries cinnamon, tinged with lilac ; tail pale cobalt-blue, with the terminal portion black tinged with ultramarine ; underparts lilac-cinnamon ; sides of the head washed with lilac ; lower abdomen and thighs washed with greenish blue ; under tail-coverts greenish blue : bill yellow ; legs greenish yellow ; iris brown. Total length about 12 inches, gape 1.45, wing 8.4, tail 5.0, tarsus 0.8.

Adult female (Madagascar).—Similar to the male, but if anything a trifle duller in colour. Total length about 11.5 inches, gape 1.35, wing 8.0, tail 4.5, tarsus 0.72.

Juv. (Madagascar, March).—Upper parts darker and duller than in the adult, underparts dull blue-green, the throat tinged with lilac ; wings and tail duller than in the adult, the tail tinged with green : bill blackish, except at the base of the lower mandible, which is yellow.

Nestling (Antananarivo).—Differs from the young bird above described in having the wings and tail much duller, the quills being blackish, slightly washed with dull blue on the outer webs ; underparts dull rufescent earth-brown, slightly washed with pale blue-green on the lower breast and abdomen ; under tail-coverts pale greenish blue.

THE present species, which is a large representative of the common African *Eurystomus afer*, inhabits Madagascar from October to March, after which, during the dry season, it leaves Madagascar and, according to Grandidier, passes that season on the east coast of Africa. It has also been obtained on the island of Anjuan, and, according to Sir Edward Newton (*Ibis*, 1863, p. 176), one was obtained by M. J. Desjardins on the Françoise river, Mauritius, late in November 1826, and deposited in the Mauritius Museum. Grandidier writes (*l. c.*):—"This Roller does not remain the whole year in Madagascar, and seldom arrives before the month of October, as already noticed by one of us in 1867 (*Rev. et Mag. de Zool.* 1867, p. 354), and it is then spread in bands on the coasts. They are especially numerous in the north-east and North-west. They leave after the rainy season, in the month of March, and the Sakalavâs, who during the night frequently go out to fish for sea-turtles, hear them, during migration, passing, calling above their heads. During the dry season they are not found here, and then inhabit the east coast of Africa." Sir Edward Newton obtained a specimen at Ranomafana and saw it also at Chasmanna, and Mr. Roch states that he found this species very numerous in the thin forest close to the village of Farafata, about six miles to the north of Tamatave.

In their habits they appear to assimilate closely with their African ally. Grandidier speaks of them as being somewhat wild, and says (*l. c.*) that "they may often be seen perched, sometimes singly and sometimes in larger or smaller numbers, on the dead branch of a tree on the edge of a clearing. They remain for long quietly in the same place, looking round and waiting patiently for their prey, and directly they see it they dart on it, catching it in their large bill, and return to their perch. In the morning and evening they play about in the air, soaring in pairs above the trees. Their flight,

though heavy and jerky, is strong and swift. Their call, a harsh and disagreeable ‘*rāka-rāka*’ or ‘*kāhāka-kāhāka*,’ similar to that of our Common Roller, is often heard during the rainy season in the woods.”

Mr. Roch also remarks that “they appear to evince a predilection for patches of forest that have been burnt, where they may be seen, generally in pairs, perched upon the branch of some tall, bare tree, sheltering their bodies from view behind the branch, uttering a hoarse chatter. They did not fly far when fired at or disturbed, but they would dive through the wood with considerable swiftness, again to take their station behind a branch on another withered tree.”

Like all the true Rollers, they nest in hollow trees and deposit pure white eggs. Grandidier states that during the pairing-season, which is late in October or in November, they bill like pigeons, and that they nest in holes in the trunks of trees, without any special preparation, and different pairs of the same band take up their habitation near each other. The male and female incubate alternately, and when one leaves in search of food the other remains and keeps watch over the young. At this season they are courageous, and will attack and pursue with fury any bird of prey that approaches their nest. Mr. Roch also states that “they nest in the fork or hollow of some tall isolated monarch of the forest, frequently choosing one devoid of any foliage. On the topmost branch one may always be seen upon the watch, while the other forages for food in the neighbourhood. On its cry of alarm the mate quickly appears, and both display considerable courage in repelling the intruder upon their solitude, probably a Kite in search of their young. I have frequently seen them do this in the burnt jungle on the left of the road between Nosibey and Foule Point. They increase their chattering hoarse cry when attacking the Kite.” The eggs are described as resembling those of *Coracias garrulus*, being pure white, oval in shape, and they measure about 34 by 28 millimetres.

This Roller feeds on insects of various kinds, especially Hemiptera and Orthoptera, on small reptiles, and occasionally, according to Grandidier, on fruit and seeds. The same authority also states (*l. c.*) that “the Sakalavās call the Eurystomi *Tsararakā* and the Betsimisarakās *Voronkāhakā* (kahaka-bird), from their harsh cry. The Antankarās give them the name of *Fitilimbaratra* (bird of thunder), because they arrive in Madagascar early in the rainy season, which is the precursor of tempests.”

The specimens figured and described are in my own collection, excepting the nestling, for the loan of which I am indebted to Prof. A. Newton.

Besides the series in the British Museum, I have examined the following specimens :—

E Mus. H. E. Dresser.

a, ♂ ; *b*, ♀ . Madagascar (*Stevens*). *c*, *d*, ad. Imerina, Madagascar (*Rev. J. Wills*). *e*, juv. Madagascar, March 1889 (*Rev. J. Wills*).

E Mus. A. & E. Newton.

a, ♀ ad. Ranomafana, Madagascar, 30th Oct., 1861 (*E. N.*). *b*, pull. Antananarivo, Madagascar (*Watkins & Doncaster*).



J. G. Keulemans del et lith.

AFRICAN BROAD-BILLED ROLLER
EURYSTOMUS AFER.

Mintern Bros. imp.

EURYSTOMUS AFER.

AFRICAN BROAD-BILLED ROLLER.

African Roller, Latham, Synop. Suppl. p. 86 (1787).

Coracias afra, Lath. Ind. Orn. i. p. 172 (1790) ; Daudin, Traité d'Orn. p. 263 (1800) ; Shaw, Gen. Zool. vii. pt. 2, p. 405 (1809) ; Wagler, Syst. Av., *Coracias*, no. 16 (1827).

Coracias africana, Shaw & Nodder, Nat. Misc. xi. pl. 401 (1799).

Le petit Rolle violet, Levaillant, Hist. Nat. Roll. et Geais, i. pl. 35 (1806).

Colaris afra (Lath.), Cuvier, Règne Anim. i. p. 401 (1817) ; Reichenb. Meropinae, p. 56, pl. 438. figs. 3201, 3202 (1852).

Eurystomus purpurascens, Vieill. Nouv. Dict. xxix. p. 427 (1819) ; id. Tabl. Encycl. et Méthod. ii. p. 872 (1823) ; Bp. Consp. Volucr. Anisod. p. 7 (1854).

Eurystomus rubescens, Vieill. Tabl. Encycl. et Méthod. ii. p. 871 (1823) ; Swainson, B. of W. Afr. ii. p. 112 (1837).

Eurystomus afra (Lath.), Steph. in Shaw's Gen. Zool. xiii. pt. 2, p. 97 (1826) ; Gray, Gen. of B. i. p. 61 (1845) ; Des Murs, Voy. Abyss. vi. p. 80 (1845-50) ; Bp. Consp. Gen. Av. i. p. 168 (1850) ; von Müller, Journ. f. Orn. 1855, p. 6 ; Antinori, Cat. descr. Ucc. p. 27 (1865).

Colaris purpurascens (Vicill.), Wagler, Syst. Av., *Colaris*, no. 2 (1827) ; Lesson, Traité d'Orn. p. 356 (1831) ; Dumont, Dict. des Sc. Nat. xlv. p. 174 (1827).

Colaris viridis, Wagler, Syst. Av., *Colaris*, no. 5 (1827) ; Reichenb. Meropinae, p. 57 (1852).

Eurystomus orientalis (nec Linn.), Rüpp. Syst. Uebers. p. 23 (1845) ; Heuglin, Syst. Uebers. p. 17 (1856).

Eurystomus viridis (Wagl.), Gray, Gen. of B. i. p. 62 (1845) ; Bp. Consp. Gen. Av. i. p. 168 (1850).

Eurystomus afer (Lath.), Gray, Cat. Fissir. Brit. Mus. p. 32 (1848) ; Strickl. Proc. Zool. Soc. 1850, p. 216 ; Hartl. J. f. Orn. 1853, p. 399 ; Bp. Consp. Volucr. Anisod. p. 7 (1854) ; Verr. Rev. et Mag. de Zool. 1855, p. 414 ; Hartl. Orn. Westafr. p. 29 (1857) ; Cassin, Proc. Philad. Acad. 1859, p. 33 ; Heine, J. f. Orn. 1860, p. 186 ; Hartl. op. cit. 1861, p. 104 ; Selater, P. Z. S. 1864, p. 110 ; Kirk, Ibis, 1864, p. 324 ; Antinori, Cat. descr. Ucc. Afr. Centr. p. 27 (1864) ; id. Journ. f. Orn. 1866, p. 200 ; Schlegel, Mus. Pays-Bas, *Coraces*, p. 142 (1867) ; Heuglin, Journ. f. Orn. 1868, p. 322 ; id. Orn. N.O.-Afr. i. p. 169 (1869) ; Sharpe, Ibis, 1869, p. 193 ; id. Proc. Zool. Soc. 1869, p. 569 ; Finsch & Hartl. Vög. Ost-Afr. p. 150 (1870) ; Blanford, Geol. & Zool. Abyss. p. 320 (1870) ; Finsch, Trans. Z. S. vii. p. 220 (1870) ; Elliot, Ibis, 1871, p. 204 ; Sharpe, tom. cit. p. 274 ; Shelley & Buckley, Ibis, 1872, p. 286 ; Sharpe, Proc. Zool. Soc. 1873, pp. 712, 716 ; Ussher, Ibis, 1874, p. 48 ; Sharpe in Layard's B. of S. Afr. p. 106 (1875) ; Reichenow, Journ. f. Orn. 1875, p. 14 ; Bocage, Journ. f. Orn. 1876, p. 406 ; Sharpe & Bouvier, Bull. Soc. Zool. Fr. i. pp. 39, 303 (1876) ; Reichenow, J. f. O. 1877, p. 2 ; Ayres, Ibis, 1877, p. 342 ; Nicholson, Proc. Zool. Soc. 1878, p. 354 ; Fischer, Journ. f. Orn. 1878, p. 287 ; Cabanis, tom. cit. p. 234 ; Oustalet, N. Arch. Mus. (2) ii. Bull. p. 71 (1879) ; Fischer & Reichenow, Journ. f. Orn. 1879, p. 343 ; Bocage, Journ. Sc. Lisb. vii. p. 253 (1880) ; id. op. cit. viii. pp. 63, 122 (1881) ; Shelley, Proc. Zool. Soc. 1881, p. 565 ; Hartl. Abh. nat. Ver. Bremen, vii. p. 110 (1881) ; Bocage, Orn. d'Angola, p. 85 (1881) ; Gurney, Ibis, 1881, p. 124 ; Sharpe in Oates' Matabele Land, App. p. 302 (1881) ; Pelzeln, Verh. Wien, xxxi. p. 143 (1881) ; id. op. cit. xxxii. p. 500 (1882) ; Salvin, Cat. Strickl. Coll. p. 412 (1882) ; Bocage, Journ. Sc. Lisb. ix. p. 21 (1882) ; Shelley, Ibis, 1882, p. 243 ; Boehm, Journ. f. Orn. 1883, p. 171 ; Schalow, tom. cit. p. 349 ; Sharpe in Layard's B. of S. Afr., App. p. 806 (1884) ; id. Journ. Linn. Soc., Zool. xvii. p. 434 (1884) ; Boehm, J. f. O. 1885, p. 37 ; Fischer, tom. cit. p. 127 ; Shelley, P. Z. S. 1885, p. 224 ; Büttik. Notes Leyd. Mus. vii. p. 158 (1885), viii. p. 248 (1886) ; Hartert,

J. f. O. 1886, p. 592; Matschie, J. f. O. 1887, p. 152; Schalow, tom. cit. p. 236; Reichen. tom. cit. p. 305; Büttik. Notes Leyden Mus. x. p. 62 (1888); Shelley, Proc. Zool. Soc. 1888, p. 44; id. Ibis, 1888, p. 298; Tristram, tom. cit. p. 266; Shelley, Ibis, 1890, p. 167; Sharpe, Cat. B. Brit. Mus. xvii. p. 30 (1892).
Cornopio afer (Lath.), Cabanis & Heine, Mus. Hein. p. 119 (1859-60); Cab. in von der Decken's Reise, iii. p. 34 (1869).
Eurystomus (*Cornopio*) *afer* (Lath.), Gray, Hand-l. of B. i. p. 76, no. 911 (1869).
 ? *Eurystomus afer*, var. *rufobuccalis*, Reichenow, J. f. O. 1892, p. 27.

Tchegala, on the Umvungu river (*fide* Oates); *Kokohia*, in Benguela; *Hobia-onganga*, at Caçaco (*fide* Anchieta); *Kongo*, in the Djur country (*fide* Antinori).

Figuræ notabiles.

Shaw & Nodder, Nat. Misc. pl. 401; Levaillant, Hist. Nat. Roll. et Geais, pl. 35; Reichenbach, Meropinae, pl. 438. figs. 3201, 3202.

HAB. Tropical Africa generally.

Ad. suprà lætè cinnamomeus, subtùs cinnamomeus pulchrè lilacino lavatus: remigibus ultramarino-cæruleis, in pogonio interno nigro marginatis et nigro apicatis: remigibus externis in pogonio externo versùs apicem viridi tinctis: tectricibus alarum majoribus ultramarinis: supracaudalibus viridi-cæruleo terminatis: rectricibus centralibus nigricantibus, ad basin viridi-cæruleo lavatis, reliquis turcino-cæruleis, saturatè cæruleo et nigro apicatis: subcaudalibus turcinis: rostro flavo: pedibus viridi-griseis: iride castaneo-fuscâ.

Juv. coloribus dilutionibus: suprà cinnamomeo-fuscus, plumis olivaceo marginatis: corpore subtùs sordidè viridi-cæruleo, pectore et gulâ cinnamomeo lavatis: rostro nigricanti-corneo, ad basin flavido.

Adult male (Kokai, 12th July).—Upper parts generally, scapulars, and smaller wing-coverts warm cinnamon; underparts cinnamon, richly washed with lilac; quills ultramarine-blue, margined on the inner web and tipped with black, the outer primaries glossed with green on the terminal portion of the outer web; larger wing-coverts and edge of the wing ultramarine-blue; median wing-coverts cinnamon tipped with greenish blue; upper tail-coverts greenish blue; central rectrices blackish, washed with greenish blue towards the base, remaining tail-feathers turquoise-blue tipped with deep blue and black; under tail-coverts turquoise-blue: bill yellow; legs greenish grey; iris chestnut-brown. Total length about 10 inches, gape 1.4, wing 7.1, tail 3.55, tarsus 0.75.

Adult female.—Resembles the male, but it is somewhat duller in colour.

Young (Fantee).—Differs from the adult in being much duller in colour; upper parts cinnamon-brown varied with dull greenish; underparts dull bluish green, varied with cinnamon-brown on the throat and breast; wings and tail as in the adult, but much duller: beak blackish horn-yellow at the base.

Young (*fide* Boehm, J. f. O. 1883, p. 172).—Uropygium brown mixed with dull greyish blue; upper tail-coverts greyish blue washed with brown; central rectrices dark grey tinged with blue, the remaining tail-feathers above the black tip rich dark blue: bill yellow, with the tip of the upper mandible horn-brown.

According to Mr. Hartert (J. f. O. 1886, p. 592), "a young bird taken out of the nest measured 23 cm. in length; bill pale yellow, grey towards the tip; feet dark grey; underparts dark grey, the plumage seeming as if eaten by vermin."

Hartert states that the adult bird has the legs and feet yellowish brown, Bocage gives them as ashy greenish, Reichenow as greenish grey, Fischer greenish brown, and Blanford as pale yellowish olive.

THE present species of Roller inhabits Northern and Central Africa, ranging on the eastern side from Abyssinia down to the Transvaal, and on the western from Senegambia to Angola.

Mr. Blanford met with it in Abyssinia only in the subtropical region of the Upper Lebka and Anseba valleys, where it was abundant; Des Murs writes (*l. c.*) that it was met with in March 1841 on the Hansé and in June on the banks of the Faggazé, and according to von Heuglin (*l. c.*) it "can scarcely be called a resident in N.E. Africa. It inhabits chiefly the wood region, and we observed it in Takah, the districts of the Bogos, in the Abyssinian lowlands, in Senaar, Kordofan, and on the White Nile. According to Antinori it appears in the Djur territory between the middle of April and the middle of May. During the rainy season (June to September) we found it more numerous in the Bogos country than in any other portions of Africa we visited, and in July we shot fledged young there." According to Finsch and Hartlaub, Verreaux's statement that it occurs in Nubia is wrong. Sir John Kirk says that it is locally distributed in the Zambesi Region and observed but rarely near Teté, but it was frequently seen in the river-valley at Chibisa on the river Shiré. Hildebrandt records it from Duruma, Nicholson from Dar-es-Salaam, and Fischer from Zanzibar, Takaungo, Lamie, Bagamayo, and Nguru. According to Captain Shelley it is found in the Matabeli country; Ayres records it from the Transvaal; Jameson obtained it on the Umvuli river in Mashoonaland, where, he states, it was very scarce, and Mr. Oates met with it near the Umvungu river in November. Finally, I may remark that Capt. Shelley records it from Tagani.

In Central Africa Boehm states that it was common early in the rainy season, but left altogether towards the end of it. Capt. Speke shot a female with an egg ready for exclusion, in October, at Usaramo; and Canon Tristram received it from Newala, between the coast and Lake Nyassa, from the Rev. S. Weigall, who informed him that it was common there. On the west side of the African continent it is found in Senegambia; Pel obtained it on the Gold Coast, Sharpe records it from Fantee, and Governor Ussher writes (*l. c.*):—"This bird, unlike its congener *E. gularis*, is usually observable only on the plains of Accra and in the eastern districts of the Gold Coast. It is generally found in pairs, and in full plumage presents a handsome appearance. Its habits appear to be similar to those of the Rollers in general. It is not so shy as *E. gularis*, and perhaps not so common." According to Messrs. Shelley and Buckley it is plentiful a short distance inland from Accra, but has not been met with near Cape Coast Castle, where its place appears to be taken by *E. gularis*. Reichenow records it from the Cameroons and Gaboon, and Hartert obtained it in the Niger Benüe district, where it was not uncommon, he says, at Loko deep in the bush in open spots. Sharpe records it from the Congo, and it was obtained by Monteiro off Mangué Grande in Angola and by Mr. Toulson at Loanda; but Professor Barboza du Bocage says, probably rare in Angola, as it was never sent by Anchieta, who, however, obtained it in Benguela, and records it from Caconda and Caçaco.

Regarding its habits, von Heuglin writes (*l. c.*):—"In its general habits and in its loud cry it is essentially a Roller. It affects the dry tree-tops of large woods alongside the river-beds and on the borders of openings, where it is usually seen in pairs, and it frequents loftier trees than the Blue Rollers. It captures insects, especially Coleoptera and grasshoppers, with great dexterity from its resting-places. Its flight is swift in spite of its heavy appearance, and it follows with ease a passing butterfly.

In the pairing-season the males are noisy and quarrelsome, are often seen fighting in the air and following one another through the close timber-growth, and they perform peculiar aerial evolutions. Unless followed they are not particularly shy, but if often disturbed become very suspicious and wary."

Mr. Blanford says that it is "a noisy bird, with a swift hawk-like flight, with all the usual habits of a Roller, but keeping rather more to high trees than *Coracias abyssinicus* and *C. pilosus*, and perhaps rather more given to rolling from side to side when flying. It often hawks locusts and other insects in the air." Antinori writes (*l. c.*) that "the negroes of the Djur call this bird 'Kongo.' It appears in the woods of the Djur after the 15th March and remains until about the middle of April. In its harsh voice and its habits generally it resembles the rest of the Coraciidæ. It always perches on the tops of the trees, especially such as are on the borders of a river or a swamp. Between nine and ten in the forenoon it appears at its drinking-places, but passes the rest of the day in the dense forests, where it hunts after insects; at midday it hides in the dense foliage and keeps quiet. When met with they were all paired. The sexes do not differ in plumage, but the chestnut-brown coloration of the iris is darker in the male than in the female. It is a very stupid bird, and if one or two are shot a third will fly off calling loudly, and after flying round for a short time will settle in the same place. Its flesh is not very palatable."

Dr. Boehm, writing about its habits as observed by him in Central Africa, says:—"This active and beautiful bird, like many of its allies, enlivens the surroundings, as it is quite lively during the heat of the day when so many other birds are quiet and still. It usually takes its stand on a scathed tree in an open place in the field, though often met with also in other places, and it starts from its stand, often traversing considerable distances with a fine falcon-like flight, in pursuit of insects. Its note is varied and is often an unmusical, quacking, harsh and grating sound, and is uttered both when the bird is seated or on the wing. In the evening they collect in large flocks to roost on the trees in the fields, and in the dusk call to each other in harsh tones. Late in November they were in pairs, and the males and females were chasing each other in the open places. They are not shy and are consequently easy to shoot."

Like its allies, it nests in hollow trees and deposits its white eggs on the rotten wood without making any nest. According to Hartert the young were fledged early in June in the Niger district; but Boehm shot a young bird in Central Africa on the 25th February, and Fischer found a nest in a hollow tree, containing three young birds, late in November, in East Africa. It feeds on insects of various sorts, which it generally, if not always, captures on the wing. Jameson says that a specimen he obtained on the Umvuli river had its crop filled with a large species of *Cicada* which was very plentiful, and a specimen shot at Caconda by Anchieta had, he states, in its stomach the remains of a species of *Julus*.

Dr. Reichenow (*l. c.*) has recently given the provisional subspecific name of *rufobuccalis* to a form from Uganda, of which, however, he only has one specimen, obtained at Manjonjo on the 11th January, 1891. This specimen, he writes, "differs from the normal coloration of the species considerably in having the sides of the head plain reddish brown, without any tinge of violet like the crown; the two central tail-feathers are, excepting the black terminal portion, washed with reddish brown on a black ground; the upper tail-coverts are only blue on the sides, the central ones being reddish brown. As *E. afer* is so widely distributed I should consider these variations as individual rather than local, unless it be an isolated form. Further collections from Uganda will elucidate the matter; meanwhile I propose to call this peculiar variety var. *rufobuccalis*."

Not having seen the specimen in question, I am unable to give an opinion as to whether it is

specifically separable from *Eurystomus afer*, and meanwhile include this name in the above synonymy with a query.

The specimen figured and described is in my own collection.

In the preparation of the above article I have, besides the series in the British Museum, examined the following specimens:—

E Mus. H. E. Dresser.

a, ♂ ad. 10th July, 1868; *b*, ♂ ad. 12th July, 1868. Kokai, Abyssinia (*Jesse*).

E Mus. H. B. Tristram.

a. Accra, April 1872 (*J. Smith*). *b*. Newala, E. Africa, 1887 (*S. Weigall*). *c*. Bathurst, Gambia, 1888 (*P. Rendall*).



J.G.Keulemans lith.

Hanhart imp.

BLUETHROATED BROADBELLED ROLLER.
EURYSTOMUS GULARIS.

EURYSTOMUS GULARIS.

BLUE-THROATED BROAD-BILLED ROLLER.

Le petit Rolle violet à gorge bleu, Levaill. Hist. Nat. Roll. et Geais, i. p. 152, pl. 56 (1806).

Eurystomus gularis, Vieill. Nouv. Dict. xxix. p. 426 (1819) ; id. Tabl. Encycl. et Méthod. ii. p. 872 (1823) ; Jard. & Selby, Ill. Orn. ii. pl. 109 (1829) ; Gray, Gen. of B. i. p. 61 (1845) ; id. Cat. Fissir. Brit. Mus. p. 33 (1848) ; Bp. Consp. Gen. Av. i. p. 168 (1850) ; id. Consp. Volucr. Anisod. p. 7 (1854) ; Verreaux, Rev. et Mag. de Zool. 1855, p. 415 ; von Müller, J. f. Orn. 1855, p. 7 ; Hartlaub, tom. cit. p. 360 ; id. Orn. W.-Afr. p. 29 (1857) ; Cassin, Proc. Acad. N. S. Phil. 1859, p. 33 ; Heine, J. f. Orn. 1860, p. 186 ; Hartlaub, op. cit. 1861, p. 104 ; Schlegel, Mus. Pays-Bas, *Coraces*, p. 143 (1867) ; Sharpe, Ibis, 1870, p. 484 ; Elliot, op. cit. 1871, p. 204 ; Sharpe, tom. cit. p. 278 ; Shelley & Buckley, Ibis, 1872, p. 286 ; Reichenow & Lühder, J. f. Orn. 1873, p. 214 ; Ussher, Ibis, 1874, p. 49 ; Reichenow, J. f. Orn. 1875, p. 14 ; Sclater, Ibis, 1876, p. 247 ; Oustalet, Nouv. Arch. Mus. (2) ii. p. 130 (1879) ; Büttik. Notes Leyd. Mus. vii. p. 159 (1885) ; Reichenow, J. f. Orn. 1887, p. 308 ; Sharpe, Cat. B. Brit. Mus. xvii. p. 32 (1892).

Colaris gularis (Vieill.), Wagl. Syst. Av., *Colaris*, no. 3 (1827) ; Reichenb. Meropinae, p. 57, pl. 438. fig. 3203 (1852).

Eurystomus collaris, Vig. Zool. Journ. v. p. 273 (1830).

Cornopio gularis (Vieill.), Cab. & Heine, Mus. Hein. ii. p. 119 (1859-60).

Eurystomus (*Cornopio*) *gularis* (Vieill.), Gray, Hand-l. of B. i. p. 76. no. 909 (1869).

Obesoa at Aburi.

Figurae notabiles.

Levaillant, Hist. Nat. Roll. et Geais, i. pl. 56 ; Jardine & Selby, Ill. Orn. ii. pl. 109 ; Reichenbach, Meropinae, pl. 438. fig. 3203.

HAB. West Africa from Liberia to the Congo.

Ad. saturatè rufescenti-cinnamomeus, pileo saturatiore : capitis lateribus et corpore subtùs lilacino lavatis : gulâ lætè cæruleâ : remigibus ultramarinis, in pogonio interno nigro marginatis et nigro apicatis : secundariis magis nigro apicatis, intimis cinnamomeo notatis : scapularibus dorso concoloribus : tectricibus majoribus ultramarinis, reliquis dorso concoloribus : caudâ subfurcatâ, rectricibus centralibus nigricantibus, reliquis turcinis, nigro-ultramarino apicatis : rostro flavo : pedibus griseo-fuscis : iride fuscâ.

Juv. sordidior : corpore subtùs cervino-cinnamomeo, viridi-griseo lavato, gulâ vix cæruleo tinctâ : rostro corneo-fusco, ad basin flavicante.

Adult male (Gaboon).—General plumage rich rufescent cinnamon, almost chestnut, crown rather darker ; sides of the head and underparts washed with brilliant lilac ; throat rich iridescent blue ; quills ultramarine-blue, bordered on the inner web and tipped with black, and washed with greenish

on the outer web; secondaries more broadly terminated with black, the inner ones blending with the rufescent cinnamon of the scapulars; wing-coverts like the back, except the primary-coverts and the edge of the wing which are ultramarine; upper tail-coverts black, edged with ultramarine and tinged with rufous cinnamon; central tail-feathers black, the rest pale turquoise-blue, broadly tipped with black, washed with deep blue; under wing- and tail-coverts like the back, the latter tipped with black: bill clear yellow; legs greyish brown; iris dark brown. Total length 10 inches, gape 1.3, wing 6.3, tail 4.2, tarsus 0.7.

Adult female.—Resembles the male.

Young (Fantee).—In general coloration resembling the adult, but much duller; underparts dull buffy cinnamon washed with dull greyish green; the throat slightly tinged with dull blue: bill horn-brown, yellowish at the base; legs greyish brown; iris brown.

THE present species, easily recognizable by its rich blue throat, is only met with in West Africa from Liberia to the Congo, its range being therefore somewhat limited. Hartlaub certainly remarks that it has been met with in Senegal, basing his statement on specimens in the Leyden Museum said to have been obtained there; but this is doubtless an error, as in Professor Schlegel's 'Mus. Pays-Bas' no mention is made of any specimens being in that Museum from the locality indicated. Verreaux records it from Galam and Grand Bassam, Governor Ussher met with it in the Fantee country and sent home specimens from Denkerá, Reichenow and Lühder record it from Aburi, and the former from the mountains of Aguapim, Pel from the Rio Boutry, Walker, Portman, and Gujon from the Gaboon, Duchaillu from the Ogobai river, and Reichenow from Kassongo in the Congo district.

For some time the present species of Roller was supposed to inhabit New Guinea, and as late as 1875 Dr. O. Beccari, in a letter to Count Salvadori (Ann. Mus. Civ. Genova, vii. p. 704), states that it is common enough in New Guinea; but this, I need scarcely say, is an error, as Dr. Beccari doubtless mistook *Eurystomus pacificus* for the present species.

As regards the habits of this Roller, Governor Ussher says (Ibis, 1874, p. 49) that "in the breaks and clearings of the Fantee forests, in cornfields, and in sweet-potato patches the Blue-throated Roller is generally a prominent object. Perched in solitude upon a naked twig, in the centre of a clear space, if possible, he will sit for hours, only quitting his post for an instant to capture some passing prey. His movements at times resemble those of a Hawk, as he will occasionally remain suspended in the air for a short period, hovering about from one bush to another, but invariably returning to his original post after a time. He is by no means so handsome a bird as *E. afer*, and is much more difficult of approach. He is generally alone, whereas *E. afer* appear to be usually in pairs." M. Verreaux also (*fide* Sharpe) says that "at Grand Bassam it is only a passing visitant. Its habits are similar to those of *E. afer*, and it is fond of tumbling in the air. It is rarer than any of the other Rollers, especially in the locality above mentioned, which is not its true home."

I find no record of its nesting-habits, but it doubtless nests, like *Eurystomus afer*, in hollow trees and deposits white eggs.

The specimens figured and described are in my own collection.

In the preparation of the above article I have, besides the series in the British Museum, examined the following specimens:—

E Mus. H. E. Dresser.

a, ♂ ad. Gaboon (*R. B. N. Walker*). *b*, *c*. Fantee (*Swanzy*). *d*, juv. Fantee (*Eyton Coll.*).

E Mus. H. B. Tristram.

a. Gold Coast. *b*. Cape Coast Castle (*Swanzy*). *c*. Erremill, Wassau, May 1872 (*Blissett*).



J. G. Keulemans lith.

Hanhart imp.

INDIAN BROAD-BILLED ROLLER.
EURYSTOMUS ORIENTALIS



J.G.Keulemans lith.

INDIAN BROAD-BILLED ROLLER.

Hanhart imp.

(BLUE VARIETY.)

EURYSTOMUS ORIENTALIS.

INDIAN BROAD-BILLED ROLLER.

- Galgulus indicus*, Briss. Orn. ii. p. 75, pl. vii. fig. 2 (1760) ; Bodd. Tabl. Pl. Enl. p. 38 (1783, ex Briss.).
- Le Rollier des Indes*, Montb. Hist. Nat. Ois. iii. p. 147 (1775) ; D'Aubenton, Pl. Enl. iii. pl. 619 (1775).
- Coracias orientalis*, Linn. Syst. Nat. i. p. 159 (1766) ; P. L. S. Müller, Natursyst. Suppl. p. 183 (1776) ; Gmel. Syst. Nat. i. p. 379 (1788) ; Lath. Ind. Orn. i. p. 170 (1790) ; Daudin, Traité d'Orn. p. 261 (1800) ; Shaw, Gen. Zool. vii. pt. 2, p. 403 (1809) ; Raffles, Trans. Linn. Soc. xiii. p. 302 (1820) ; Wagl. Syst. Av., *Coracias*, no. 18 (1827).
- Oriental Roller*, Lath. Syn. i. p. 411 (1781).
- Le Rolle à gorge bleu*, Levaill. Hist. Nat. Roll. et Geais, i. p. 183, pl. 36 (1806).
- Colaris orientalis* (Linn.), Cuvier, Règn. Anim. i. p. 401 (1817) ; Horsf. Trans. Linn. Soc. xiii. p. 162 (1820) ; Bp. Consp. Volucr. Anisod. p. 7 (1854).
- Eurystomus cyanocollis*, Vieill. Nouv. Dict. xxix. p. 425 (1819) ; id. Tabl. Encycl. et Méthod. p. 871 (1823) ; id. Gall. Ois. i. p. 176, pl. iii. (1825) ; Eyton, P. Z. S. 1839, p. 101.
- Eurystomus fuscicapillus*, Vieill. Nouv. Dict. xxix. p. 426 (1819) ; id. Tabl. Encycl. et Méthod. p. 872 (1823).
- Eurystomus orientalis* (Linn.), Steph. in Shaw's Gen. Zool. xiii. pt. 2, p. 97 (1826) ; Lesson, Man. d'Orn. p. 401 (1828) ; Swains. Classif. of B. ii. p. 333 (1837) ; Gray, Gen. of B. i. p. 61 (1845) ; id. Cat. Mamm. &c. Nepal, p. 55 (1846) ; id. List Fissir. Brit. Mus. p. 31 (1848) ; Blyth, Cat. of B. in Mus. As. Soc. Beng. p. 51 (1849) ; Bp. Consp. Gen. Av. i. p. 168 (1850) ; Reichenb. Meropinae, p. 54, pl. 437. figs. 3195, 3196 (1852) ; Licht. Nomencl. Av. p. 68 (1854) ; Moore, P. Z. S. 1854, p. 267 ; Horsf. & Moore, Cat. B. E. I. Co. Mus. i. p. 121 (1854) ; Hartl. J. f. O. 1855, p. 154 ; Cassin, U.S. Expl. Exp., Mamm. & Orn. p. 228 (1858) ; Cab. & Heine, Mus. Hein. ii. p. 120 (1859-60) ; Swinhoe, Journ. As. Soc. Beng. xxix. p. 243 (1860) ; G. R. Gray, Proc. Zool. Soc. 1860, p. 345 ; Swinhoe, Ibis, 1860, p. 48 ; id. Ibis, 1861, p. 31 ; Jerdon, B. of India, i. p. 219 (1862) ; Sclater, Proc. Zool. Soc. 1863, p. 214 ; Swinhoe, tom. cit. p. 269 ; Radde, Reis. im Süd. v. Ost-Sib. ii. p. 143 (1863) ; Pelzeln, Novara Exp., Vög. p. 42 (1865) ; Martens, Journ. f. Orn. 1866, p. 17 ; Bulger, Ibis, 1869, p. 155 ; Schlegel, Mus. Pays-Bas, *Coraces*, p. 139 (1867) ; Gray, Hand-l. of B. i. p. 76, no. 906 (1869) ; Homeyer, Journ. f. Orn. 1869, p. 50 ; Blanford, Ibis, 1870, p. 465 ; Elliot, Ibis, 1871, p. 209 ; Swinhoe, Proc. Zool. Soc. 1871, p. 347 ; Jerdon, Ibis, 1872, p. 3 ; Walden, tom. cit. p. 100 ; Holdsworth, Proc. Zool. Soc. 1872, p. 423 ; Walden, Trans. Zool. Soc. viii. p. 43 (1872) ; id. Ibis, 1873, p. 302 ; Vipan, Str. Feath. i. p. 495 (1873) ; Hume, Nests & Eggs of Ind. B. p. 105 (1873) ; Salvadori, Ucc. di Borneo, p. 105 (1874) ; Hume, Str. Feath. ii. p. 164 (1874) ; Morgan, tom. cit. p. 531 (1874) ; Godwin-Austen, Journ. As. Soc. Beng. xlviii. pt. 2, p. 154 (1874) ; Meyer, Mitth. a. d. Zool. Mus. Dresd. i. p. 19 (1875) ; Oates, Str. Feath. iii. p. 336 (1875) ; Dybowski, J. f. O. 1876, p. 192 ; Blyth & Wald. B. of Burm. p. 72 (1875) ; Sharpe, Tr. Linn. Soc., 2nd ser. Zool. i. p. 316 (1876) ; Taczanowski, Bull. Soc. Zool. Fr. i. p. 135 (1876) ; Hume, Str. Feath. iv. p. 382 (1876), v. p. 18 (1877) ; Bouvier, Bull. Soc. Zool. Fr. ii. p. 295 (1877) ; David & Oustalet, Ois. de la Chine, p. 71 (1877) ; Tweeddale, P. Z. S. 1877, pp. 670, 757, 1878, pp. 282, 341, 613 ; Legge, B. of Ceylon, p. 285 (1878) ; Taczanowski, Bull. Soc. Zool. Fr. iii. p. 135 (1878) ; Hume & Davison, Str. Feath. vi. p. 72 (1878) ; Meyer, Ibis, 1879, p. 60 ; Sharpe, tom. cit. p. 249 ; id. P. Z. S. 1879, p. 332 ; Tiraut, Ois. Basse-Cochinch. p. 99 (1879) ; Hume, Str. Feath. viii. pp. 49, 85 (1879) ; Bingham, tom. cit. p. 193 (1879) ; id. op. cit. ix. p. 153 (1880) ; Salvadori, Orn. Papuas. i. p. 508 (1880) ; Bolau, J. f. O. 1880, p. 115 ; Kelham, Ibis, 1881, p. 379 ; Sharpe, P. Z. S. 1881, p. 793 ; Nicholson, Ibis, 1882, p. 67 ; Müller, J. f. O. 1882,

- p. 393; Salvin, Cat. Strickl. Coll. p. 412 (1882); Oates, B. Brit. Burmah, ii. p. 70 (1883); Davison, Str. Feath. x. p. 351 (1883); Blakist. Amend. List B. Jap. p. 25 (1884); Guillemard, P. Z. S. 1885, pp. 255, 547, 568; Styan, Ibis, 1887, p. 229; Büttik. Notes Leyd. Mus. ix. p. 41 (1887); Taczanowski, P. Z. S. 1887, p. 600; id. P. Z. S. 1888, p. 462; Dorries, J. f. O. 1888, p. 64; Hume, Str. Feath. xi. p. 43 (1888); Sharpe, Ibis, 1888, p. 197; Blasius, Ornith., 1888, p. 579; Sharpe & Salvad. Agg. Orn. Papuas. p. 60 (1889); Sharpe, Ibis, 1890, p. 21; Whitehead, tom. cit. p. 45; Sharpe, P. Z. S. 1890, p. 550; Steere, List B. & Mamm. Philipp. p. 9 (1890); Oates in Hume's Nests & Eggs Ind. B. iii. p. 57 (1890); Dresser, Ibis, 1891, p. 99; Styan, tom. cit. p. 483; Sharpe, Cat. B. Brit. Mus. xvii. p. 33, pl. ii. fig. 1 (1892).
- Colaris cyanicollis* (Vieill.), Wagl. Syst. Av., *Colaris*, no. 4 (1827); Lesson, Traité d'Orn. p. 356 (1831); Bp. Consp. Volucr. Anisod. p. 7 (1854); Pelz. Novara Exp., Vög. p. 42 (1863).
- Colaris garrula* (nec Linn.), Guérin-Ménév. Icon. Règn. Anim. pl. 22. fig. 2 (1829-38).
- Eurystomus calonyx*, Hodgs. Icon. incl. in Brit. Mus., *Passeres*, pls. 10, 11; id. in Gray's Zool. Misc. p. 82 (1844); Sharpe, P. Z. S. 1890, p. 551; Styan, Ibis, 1891, p. 317; Taczanowski, Faune Orn. Sib. Orient. p. 188 (1891); Sharpe, Cat. B. Brit. Mus. xvii. p. 38, pl. ii. fig. 2 (1892).
- Eurystomus cyanicollis*, Vieill., Bp. Consp. Gen. Av. i. p. 168 (1850); Reichenbach, Meropinae, p. 55, pl. 437. fig. 3197 (1852).
- Eurystomus pacificus* (nec Lath.), Motl. & Dillw. Contrib. Nat. Hist. Labuan, p. 11 (1855).
- Eurystomus calornyx*, Hodgs., Jerdon, B. of Ind. i. p. 219 (1862).
- Eurystomus (Colaris) orientalis* (Linn.), Radde, Reis. im Süd. Ost-Sib. ii. p. 143, pl. 2. fig. 2 (1863).
- Eurystomus laetior*, Sharpe, P. Z. S. 1890, p. 551; id. Cat. B. Brit. Mus. xvii. p. 36 (1892).
- Phoyiong-pho*, amongst the Lepchas of Darjeeling; *Leuk-kotsoey*, Cantonese; *Tihong-lampay*, *Tjetje*, Malayan; *Lallie*, Bornean; *Tiong Batu*, Sumatran.

Figurae notabiles.

- D'Aubenton, Pl. Enl. iii. pl. 619; Levaillant, Hist. Nat. Roll. et Geais, pl. 36; Reichenbach, Meropinae, pl. 437. figs. 3195, 3196, 3197; Vieill. Gal. Ois. i. pl. iii.; Radde, Reis. im Süd. v. Ost-Sib. pl. 2. fig. 2; Sharpe, Cat. B. Brit. Mus. xvii. pl. ii. figs. 1, 2.

HAB. Eastern Asia from Amoorland to China; India from the Himalayas to Ceylon and the Andamans; Burmah, Malacca, Java, Sumatra, Borneo, and Philippines.

♂ *ad.* suprâ saturatè viridi-cæruleus, capite sordidè nigro: uropygio et supracaudalibus magis cæruleo tinctis: remigibus nigris, in pogonio externo versùs basin saturatè ultramarinis: plagâ pallidè cæruleâ ad basin: secundariis intimis ultramarino marginatis: tectricibus alarum ultramarinis vix viridi lavatis: caudâ nigrâ, rectricibus ad basin saturatè ultramarino marginatis: gulâ saturatè ultramarinâ cæruleo striatâ: corpore reliquo subtùs viridi-ultramarino: rostro et pedibus rubris: iride fuscâ.

♀ *ad.* mari similis.

Juv. adulto similis, sed gulâ sordidè nigrâ nec ultramarinâ, rostro nigro flavo marginato et ad basin sordidè rubro.

Adult female (Cebu, March).—Upper parts generally deep bluish green; the crown and nape darker, nearly black; the upper surface of the wing and the rump slightly lighter and bluer; quills black externally, margined with blue near the base; the primaries with a basal patch of silvery blue; inner secondaries margined with deep blue externally; wing-coverts deep blue, slightly washed with green; tail black, the feathers margined externally with deep blue on the basal half; sides of the head and neck dull blackish like the crown; throat deep blue with fine stripes of a lighter blue; rest of the underparts blue with a tinge of green: bill, legs, and feet red, the tip of the beak black; iris dark brown (iris greyish brown, *fiâe* Meyer). Total length about 10·5 inches, gape 1·2, wing 7·3, tail 4·6, tarsus 0·75.

Adult male (Foochow, 8th May).—Resembles the female, but is a trifle more blue in tinge of colour and has rather more blue on the tail-feathers. Total length about 10·5 inches, gape 1·35, wing 7·3, tail 3·8, tarsus 0·8.

An adult male from S. Tenasserim differs from the above in being much greener in general tinge of colour and rather paler on the head; inner secondaries with rather less blue on the external webs; tail as in the above specimen, with only the basal half of the feathers margined with blue.

Young (Sanghir Island).—Differs from the adult only in having the blue on the throat much less developed and rather duller in colour, and in having the bill blackish yellowish at base and along the gape.

Another full-grown immature bird from Sikkim (spec. *c*) has no trace of blue on the throat and the bill is rather darker, but it has the pale blue patch on the base of the primaries fairly well developed, and the underparts, especially the breast, are duller in colour.

Nestling (♂, Butuan, May).—Resembles the adult, but there is the merest tinge of blue on the throat, the blue patch being absent, and the silvery-blue patch on the primaries is also lacking, and the bill is black, the base and the edge of the gape yellowish. In life, according to Mr. Styan, “the upper mandible is black, rimmed with yellow, the lower mandible reddish, the feet dark red above.”

As above indicated, the present species has a wide range, extending from the Amoor and India to China and Japan, and from Ceylon to the Philippines and Moluccas.

In India this Roller is found in the valleys of the Himalayas (and is by no means rare in those of Sikkim), in Lower Bengal, Assam, and Burmah. Col. Godwin-Austen met with it at Dinapur in the Naga Hills; Mr. Inglis speaks of it as being not uncommon in North-eastern Cachar, where it remains throughout the year; and Hume states that, according to Thompson, it breeds in the Terai below Kumaon and extends from the Sardah to the Ganges, being especially numerous in the Kotree Doon. According to Mr. Oates (*l. c.*) it is “locally distributed over the greater part of Burmah. Mr. Blyth records it from Arrakan; I observed it in Pegu in the hills north of Pegu Town, at Tonghoo, and at Shwaygheen; Capt. Wardlaw Ramsay got it on the Karin hills, and Mr. Blanford at Bassein; Mr. Davison states that it is confined to the southern portion of Tenasserim, but Capt. Bingham found it in the Thoungyeen valley.” It occurs throughout Southern India to Ceylon and the Andamans. Mr. Rhodes W. Morgan records it as being by no means rare in the Malabar forests, and he obtained it at Nellumbore. Capt. Vipan met with it near the foot of the Carcoor Ghât of the Nilghiris. Mr. Bourdillon, who records it from the Travancore hills as nowhere abundant and probably only a visitor, observed it in August, during the winter months, in April, and as late as May. In Ceylon it is, according to Col. Legge, “almost without exception the rarest resident form;” he only met with it twice. Layard states that but three specimens came under his notice, and there have been but few other records of its occurrence in that island. In the Andamans, according to Davison (*fide* Hume), it is comparatively common about Port Mouat, Mount Harriet, and other well-wooded places.

It ranges in Asia as far north as Amoorland. Dr. Radde records a young bird as having been obtained at Port May by Dr. Wulffius. Dr. Dybowski states that it was seen but not obtained in

Dauria; and according to Taczanowski (Faun. Orn. Sib. Orient. p. 188) "a flock of about twenty dropped on the island of Askold late last May (1877). The first day they were so wearied that they could be easily approached, but the following day they became so shy that it was impossible to get within gunshot range, and on the third day they disappeared."

It is found in Manchuria, the Corea, and China, and Blakiston includes it in his 'Amended List of the Birds of Japan' with a query, but there does not appear to be any record of a specimen having been obtained there. Taczanowski states that it is a common summer resident in Corea. Swinhoe speaks of it as being very rare in Amoy; and Père David states that "at Peking it is rare, but common in the central provinces of China and found wherever there are groves of large trees, but it leaves these regions when the heat becomes great and when insects, on which it feeds, are less numerous." According to Mr. Styan, "it arrives at Foochow towards the end of April, and leaves towards the end of September or beginning of October."

It inhabits Cochin China, Siam, the Malay Peninsula, and the islands in the Malay Archipelago as far as the Halmahera group, where, according to Count Salvadori, it meets the Pacific form (*E. pacificus*). I have examined specimens from Java, Sumatra, Borneo, the Philippines, Celebes, &c. Lieut. Kelham, who met with it in the Malay Peninsula, writes (*l. c.*) as follows:—"This Roller appears to be distributed throughout the country, but is particularly plentiful among the virgin forests of Perak. I hardly like to say it is nocturnal in its habits; still it is rarely met with during the heat of the day; but in the country round Kwala Kangsar, Perak, I frequently saw it of an evening when on my way home after a day in the jungle; it was usually perched on the upper branches of some tree, from which it made short flights into the air in pursuit of insects. The first one I shot was only winged, and, turning on its back and uttering harsh screams, it fought most savagely with my dog." Wallace obtained it in Java, Raffles in Sumatra, and Rajah Brooke, Mr. Whitehead, and Messrs. Ussher and Treacher in Borneo; and in the Philippines it has been obtained by many collectors, and appears to be common. According to Mr. Whitehead, it is resident in the latter islands, and there are specimens in the Tweeddale collection obtained at all seasons of the year. It certainly breeds there, as I have a young bird, barely fledged, obtained by Mr. A. H. Everett. In the Sulu Archipelago, however, according to Dr. Guillemard, it does not appear to be common. I have examined three specimens from Celebes which agree closely with examples from the Philippines, but have not had an opportunity of examining a specimen of the present species from the Halmahera group, where, according to Salvadori, it meets the eastern form.

Dr. Sharpe (Proc. Zool. Soc. 1890, pp. 550-552, and Cat. Brit. Mus. vol. xvii.) separates *Eurystomus orientalis* into three species—*E. orientalis*, *E. lætior*, and *E. calonyx*, but in this view I cannot in the least acquiesce, for the reasons which I have already given (Ibis, 1891, pp. 99-102). The chief distinctive character, as given by Dr. Sharpe, is the amount of blue on the tail and the secondaries; but, as I showed in a table of the specimens I had examined from various localities, these characteristics are so irregular that they cannot be relied on; and as specimens I have since examined fully confirm my views as then stated, I have no hesitation in consigning Dr. Sharpe's names of *E. lætior* and *E. calonyx* to the limbo of synonyms, where they justly belong.

There is no doubt that there is great individual variation in this species wherever it is found, and the only question is whether it would not be more advisable to unite *Eurystomus pacificus* with the present species rather than to still further complicate the synonymy by splitting *E. orientalis* into three species. Where the ranges of *E. orientalis* and *E. pacificus* meet there are certainly intermediate specimens to be found, but further east and in Australia the eastern species alone is to be met with, and shows no tendency towards *E. orientalis*, and for that reason I have deemed it expedient

to keep the eastern form separate. Referring to this question, Dr. Guillemard writes (P. Z. S. 1885, p. 568) that two specimens (from Ternate and Batchian) "have the pallor of the more eastern race, which is by Salvadori and others regarded as a distinct species under the name of *E. pacificus*. The third, a male from Ternate, is darker and of the occidental type. An examination of a series of skins from Malacca eastwards to New Guinea shows such a gradual shading of the western into the eastern form, that they appear to me to be hardly separable." As previously stated, I found a considerable variation in the series I have examined, both as regards size and coloration. Specimens from the Andaman Islands appear to vary less *inter se* than those from any other locality, and have the bill larger, nearly as large as in *Eurystomus crassirostris*. In size the variations from the different localities are—gape 1.35 to 1.5 inch, wing 7.1 to 7.75, tail 3.9 to 4.5, tarsus 0.7 to 0.75.

As regards coloration, the variation is very considerable, and what struck me most was the variation from blue to green in general tone of colour, and I have therefore deemed it advisable to give a figure of the most extreme form of each. Some specimens are much greener and others much bluer, but much depends on the light, as in some lights the bird appears greener or bluer than it does in others. The greenest specimen I have examined is from Tenasserim, and the bluest from the Philippines, and the richest examples in general coloration and those having the head darkest are from the Philippines and Northern Borneo.

The present species of Roller appears to be essentially a forest-haunting bird, never found inhabiting any other than well-wooded localities, where it affects the tall dead trees and usually keeps at a great height, so that it is as a rule not easy to obtain. It is stated by most observers to be almost crepuscular in its habits, being seen chiefly in the early morning and late in the day, while during the warm portion of the day it is indolent and averse to move about, and remains chiefly on a dry branch of some dead tree. Dr. A. B. Meyer, however, says that "it sleeps in the morning and searches for food at midday; in the evening it flies after beetles. It is to be seen near river-banks, where it sits a long time quietly on a branch of a tree over the water, and can easily be shot, not being a shy bird." Mr. Swinhoe remarks that when resting on a branch it usually sits along and not across it, thus reminding one of a Goatsucker, and he found the bird shy and difficult of approach. Its flight is said to resemble that of its allies, but it usually flies at a greater altitude than most of them. Peale says that its flight so closely resembles that of the Kingfishers that one was shot by mistake, it having been taken for a large Kingfisher; and the Abbé A. David states that its flight is elevated, direct, sustained, and very rapid, and when on the wing the brilliant coloration of its wings shows well against the blue of the sky. It is bold and makes itself respected by the Kites and Crows. In captivity, he adds, it takes any sort of food, but is savage and bites hard, uttering a cry like a Jay, and it frequently climbs about on the furniture, making use of its bill like a parrot. Dr. Guillemard remarks that it is active in its movements, taking short restless flights, and he found it difficult to obtain. Mr. Davison, who, by the way, remarks that it may frequently be seen seated on some stump in a garden or other comparatively open place, from which perch it takes short flights, occasionally alighting on the ground to capture an insect, writes that on several occasions he saw it rise into the air and go through a regular series of fantastic evolutions, sometimes keeping them up for nearly three minutes.

Its note is harsh and is said to resemble that of a Jay. Dr. Meyer describes it as resembling the syllables *kiak*, *kiak*, and Mr. Davison says that it is anything but musical, but that the bird is as a rule rather silent; and Peale remarks that a specimen when wounded uttered a harsh cry similar to that of some species of Parrot. Swinhoe compares the note with the *quack* of a Goatsucker; and Père Armand David says that "its call-note, which may be described by the syllable *ka*, is deep, guttural,

and very characteristic, and is always uttered when an enemy approaches the tree in which its young are."

Its food consists of insects of various kinds, which it obtains chiefly by darting from its perch and catching them on the wing, but it also picks them up from off the ground. Dr. Meyer remarks that in the stomachs of those he examined he often found many beetles with very hard elytra.

There appears to be little doubt that, like its congeners, the present species makes its nest in the hollows of trees and deposits white eggs. Père Armand David (*l. c.*) certainly states that "it constructs its nest, which somewhat resembles in form that of our Common Jay, at the base of the most elevated branches;" but he must have mistaken the nest of some other bird for that of this Roller. Mr. Thompson, writing from the Terai below Kumaon, informed Mr. Hume that "in April the Broad-billed Rollers arrive, begin to breed in May, and finally leave the forests in July and August. They breed in holes in the higher branches (never less than 50 feet from the ground) of the loftiest sâl trees. They extend from the Sardah to the Ganges, but particularly abound in the Kotree Doon, where they breed in company with *Eulabes intermedia* in the dense and lofty sâl forests, to which they are strictly confined." To this Mr. Oates adds, in the second edition of Mr. Hume's 'Nests and Eggs of Indian Birds,' "Mr. F. W. Bourdillon writes from Travancore:—'On March 17th I was attracted by hearing the chattering of a pair of these Rollers. On going to the spot I found them engaged in ejecting from a hole in a vedu-plâ stump (*Callenia excelsa*), about 40 feet from the ground, a pair of our Hill-Mynahs (*Eulabes religiosa*). One of the Rollers was in the mouth of the hole, and enlarging it by tearing away with its beak the soft rotten wood. The other Roller, seated on a tree close by, was doing most of the chattering, making an occasional swoop at the Mynahs whenever they ventured too close. I watched the birds for some time until the Mynahs went off, and there and then began building in a pinney tree (*Calophyllum elatum*) within the distance of 100 yards. Ten days after I sent for some hillmen, who managed to ascend by tying up sticks with strips of cane, in the way that they erect ladders to obtain the wild honey from the tallest trees in the forest. It was past six o'clock in the evening before a man reached the hole in which the birds had bred. He found not the slightest vestige of a nest, but a few chips of rotten wood, upon which were laid the three eggs. These I found to be slightly set. While the man was climbing the tree, the birds behaved in a very ridiculous and excited manner: seated side by side on a bough, they alternately jerked head and tail, keeping up an incessant harsh chatter, and as the crisis approached, and the man drew nearer their property, they dashed repeatedly at his head. After the eggs were taken the birds disappeared for about a fortnight, but returned, and I believe laid again in the same position. I did not molest them this time, wishing to get the young. Unfortunately I had to leave home, and on my return I found the birds, old and young, had disappeared.'"

Mr. T. Fulton Bourdillon also found a pair breeding in a hole in a dead tree, but did not take the nest; and Dr. Guillemard, in his notes on this Roller in the Sulu Archipelago, says that in the month of May he watched a pair constantly passing in and out of a hole in a lofty tree in which they appeared to have young ones.

Eggs of this Roller, sent to Mr. E. W. Oates from Mynall by Mr. Bourdillon, "closely resemble," he says, "those of the Indian Roller, but are somewhat larger, though not quite so large as those of the European Roller. They are very broad ovals, pure white, and faintly glossy." In length they vary from 1.34 to 1.42 inch, and in breadth from 1.14 to 1.16.

The specimens figured (specimens *a* and *h* in my collection) are to show the extreme variation between the green and blue forms, and those described are specimens *a*, *c*, *g*, *h*, *i*, and *l*, also in my own collection.

In the preparation of the above article I have examined, besides the series in the British Museum (which includes the Tweeddale and Hume collections), the following specimens:—

E Mus. H. E. Dresser.

a, ♂. S. Tenasserim, 22nd January, 1877 (*E. W. Oates*). *b, c*. Sikkim, 1875 (*W. E. Brooks*). *d*, ♂ ad. Arrakan Hills, January 1872 (*E. W. Oates*). *e*. Cocos, Keeling Islands, 1887. *f, g*, ♂ ad. Foochow, 8th May, 1887 (*Campbell*). *h*, ♀ ad. Cebu, Philippines, March 1877 (*A. H. Everett*). *i*, pull. Butuan, May 1877 (*A. H. Everett*). *k*. Philippines (*A. H. Everett*). *l*. Sanghir Island (*Gerrard*). *m*. Celebes (*Gerrard*).

E Mus. H. B. Tristram.

a, ♂. Sumatra, 1861 (*A. R. Wallace*). *b*. Borneo (*Motley*). *c, d*. Labuan, October 1885 and December 1887 (*A. H. Everett*).

E Mus. J. Whitehead.

a. Malacca. *b*, ♂. Palawan, 27th August, 1887 (*J. W.*). *c*, ♀. Kina Balu, N. Borneo, April (*J. W.*).

E Mus. H. Seebohm.

a. Amoy, May 1866 (*R. Swinhoe*). *b*. Malacca. *c*, ♂. Ternate, 16th May, 1861 (*Bernstein*).



J.G. Keulemans lith.

Hanhart imp.

AUSTRALIAN BROAD-BILLED ROLLER.
EURYSTOMUS PACIFICUS.

EURYSTOMUS PACIFICUS.

AUSTRALIAN BROAD-BILLED ROLLER.

Pacific Roller, Lath. Gen. Synops. Suppl. ii. p. 371 (1787).

Coracias pacifica, Lath. Ind. Orn. Suppl. p. xxvii (1801) ; Shaw, Gen. Zool. vii. pt. 2, p. 402 (1809) ; Vieill. Nouv. Dict. xxix. p. 435 (1819) ; Dumont, Dict. Sc. Nat. xlv. p. 183 (1827).

Galgulus pacificus (Lath.), Vieill. Tabl. Encycl. et Méthod. ii. p. 870 (1823).

Eurystomus orientalis (nec Linn.), Vig. & Horsf. Trans. Linn. Soc. xv. p. 202 (1826) ; Gray, P. Z. S. 1860, p. 345 ; Finsch, Neu-Guinea, p. 160 (1865, pt.) ; Schlegel, Mus. Pays-Bas, *Coraces*, p. 139 (1867, pt.) ; Walden, Trans. Z. Soc. viii. p. 43 (1872) ; Brüggem. Abh. nat. Ver. Bremen, v. p. 49 (1876) ; Meyer, Ibis, 1879, p. 60 ; id. Verh. zool.-bot. Ges. Wien, xxxi. pp. 763-769 (1881) ; id. Sitz. N. Abh. Ges. Isis, Abth. i. p. 5 (1884) ; Guillem. P. Z. S. 1885, pp. 568, 629.

Eurystomus australis, Swainson, Classif. of B. ii. p. 333 ; id. Anim. in Menag. p. 326 (1838) ; Licht. Nomencl. Av. p. 68 (1854) ; Gould, B. of Austral. ii. pl. 17 (1848) ; Reichenb. Vög. Neuholl. p. 38 (1850) ; Sharpe, Cat. B. Brit. Mus. xvii. p. 36 (1892).

Eurystomus pacificus (Lath.), Gray, Ann. & Mag. Nat. Hist. xi. p. 190 (1843) ; id. Gen. of B. i. p. 61 (1845) ; id. Cat. Fissir. Brit. Mus. p. 32 (1848) ; Blyth, Cat. B. Mus. As. Soc. p. 51 (1849) ; Reichenbach, *Meropinae*, p. 55, pl. 437. figs. 3198, 3199 (1852) ; Gould, P. Z. S. 1858, p. 171 ; Gray, Cat. Mamm. &c. New Guin. pp. 18, 54 (1859) ; Cab. & Heine, Mus. Hein. ii. p. 120 (1860) ; Wallace, Ibis, 1860, p. 147 ; id. P. Z. S. 1862, p. 339, 1863, p. 25 ; Rosenb. J. f. O. 1864, p. 118 ; Gould, Handb. B. Austr. i. p. 119 (1865) ; Blyth, Ibis, 1865, p. 30 ; Pelzeln, Novara Exp., Vög. p. 42 (1865) ; Ramsay, Ibis, 1866, p. 327 ; Selater, P. Z. S. 1869, p. 121 ; Gray, Hand-l. of B. i. p. 76, no. 907 (1869) ; Elliot, Ibis, 1871, p. 204 ; Ramsay, P. Z. S. 1875, p. 582 ; Selater, Ibis, 1876, p. 247 ; Cab. & Reichenow, J. f. O. 1876, p. 323 ; Beccari, tom. cit. p. 247 ; Salvad. & D'Albert. Ann. Mus. Genov. xiv. p. 53 (1879) ; Salvadori, Orn. Papuas. i. p. 503 (1880) ; Salvin, Cat. Strickl. Coll. p. 412 (1882) ; Cheeseman, Trans. & Proc. N. Zeal. Inst. xiv. p. 265 (1882) ; Forbes, P. Z. S. 1884, pp. 426, 443 ; Meyer, Sitz. N. Abh. Ges. Isis, Abth. i. pp. 7, 10 (1884) ; Büttik. Notes Leyd. Mus. vii. p. 62 (1886) ; Meyer, Zeitsch. ges. Orn. iii. p. 34 (1886) ; Buller, B. New Zeal. 2nd ed. i. p. 118 (1888) ; Ramsay, Tab. List Austr. B. p. 3 (1888) ; Kirk, Ibis, 1888, p. 46 ; Salvad. Orn. Papuas., App. p. 60 (1889) ; Tristr. Ibis, 1889, p. 556.

Eurystomus pacifica (Lath.), Bp. Consp. Gen. Av. i. p. 168 (1850).

Colaris pacificus (Lath.), Bp. Consp. Volucr. Anisod. p. 7 (1854).

Eurystomus gularis (nec Vieill.), Rosenb. J. f. O. 1864, p. 118 ; Beccari, Ann. Mus. Genov. vii. p. 708 (1875).

Eurystomus crassirostris (nec Sel.), D'Albertis, Ann. Mus. Genov. x. p. 12 (1877).

Dollar Bird, in Australia ; *Naty-kin*, amongst the Aborigines of New South Wales.

Figuræ notabiles.

Gould, B. of Australia, ii. pl. 17 ; Reichenbach, *Meropinae*, pl. 437. figs. 3198, 3199.

HAB. Celebes and the Moluccas, New Guinea, Australia, and, as a straggler, New Zealand.

Ad. Eur. orientali similis, sed omnino pallidior, corpore suprâ pallidè fusco-olivaceo, capite vix obscuriore : loris nigricantibus : corpore subtùs pallidè fusco-thalassino, abdomine imo et subcaudalibus thalassinis : caudâ magis ultramarino coloratâ quam in *Eur. orientali* : rostro et pedibus miniatis, iride fuscâ.

Juv. coloribus omnino obscurioribus et sordidioribus, gulâ minus cyaneo notatâ ; culmine nigricante.

Adult male (S. Queensland).—In general coloration much paler than *Eurystomus orientalis* ; upper parts dull pale brownish olivaceous, slightly darker on the head and paler towards the rump ; lores blackish ; underparts and the breast pale brownish olivaceous, washed with blue-green, becoming greener on the abdomen ; lower abdomen and under tail-coverts pale blue-green ; tail with the dark blue extending over two-thirds of the length of the feathers : bill and feet vermillion ; iris brown. Total length about 10 inches, gape 1·4, wing 7·5, tail 3·6, tarsus 0·7.

Adult female (Ceram).—Resembles the male. Total length about 10 inches, gape 1·4, wing 7·4, tail 3·8, tarsus 0·7.

Young (New Guinea).—Much duller in colour than the adult, the blue patch on the throat less developed ; culmen blackish.

THE present species, differing from *Eurystomus orientalis* in its paler and duller coloration, ranges from the islands south and east of Celebes to New Guinea and Australia. Where the ranges of this species and *E. orientalis* meet is rather difficult to decide, as in some districts the two forms have not yet been properly differentiated ; indeed many naturalists, amongst whom I may mention the late Professor Schlegel, have united the two, but it appears to me that they should be kept separate, and in this view most of the recent authorities concur.

Count Salvadori remarks that some of the specimens from Halmahera examined by him are referable to *E. pacificus*, whereas others agree with examples from Celebes and the Philippines, and he believes the two species meet in Halmahera. He gives the range of the present species (Orn. Papuas. i. p. 503) as follows :—“ New Holland (*Vig. & Horsf.*) ; Fly river, New Guinea (*D'Albertis*) ; Dorey (*Wallace, Bruijn*), Andai (*Bruijn*), Mansinam (*Beccari*), Sorong (*D'Albertis*), Mariate (*Bruijn*), Ramoi, Faur (*D'Albertis*), Segaar (*Cab. & Reichenow*), Salvatti (*Bruijn, Beccari*), Batanta (*Bruijn, Beccari*), Ghemien (prope Waigiou), Guebèh (*Bernstein*), Mysol (*Wallace*), Aru (*Wallace &c.*), Kei Island (*Rosenberg, Beccari*) ; in the Moluccas—?Tijor Island (*Rosenberg*), ?Ceram (*Moens, Hoedt*), ?Amboina (*Hoedt*), Buru (*Wallace*), Obi majore (*Bernstein*), Batjian, Ternate (*Wallace, Bernstein*), ?Tidore, Halmahera, ?March, ?Morty (*Bernstein*), Timor, ?Flores, ?Lombok (*Wallace*).” To this he adds the following notes :—“ *E. pacificus* is the representative of *E. orientalis* in the regions to the east and south of Celebes ; it is found in Australia, New Guinea, and the islands not included in the western part, namely in the islands of Aru, in Misol, in Salvatti, in Batanta, in Jobi, and perhaps also in Wagiou, in Guebèh, and in Ghemien. To the same form belong specimens from the island of Kei and perhaps also some from the Ceram group (Tijor, Ceram, Amboina) ; I have examined two examples from Buru and believe them to be referable to this form rather than to *E. orientalis* ; Wallace refers to *E. pacificus* all individuals from the Timor group ; finally a portion of the specimens from Halmahera examined by me appear to be referable

to *E. pacificus*, whereas the larger number are more richly coloured and are in every respect similar to others from Celebes, from the island of Sanghir, and from the Philippines with which I have compared them, and it therefore appears probable that the two species meet in Halmahera." To this I may add that von Pelzeln states that he examined a specimen from Java, received from Temminck, which entirely agreed with the Australian examples; but the only specimen from Java which I have examined is certainly referable to *Eurystomus orientalis* and not to the present species. I have several specimens of this Roller before me from Ceram, one from Norfolk Island, one from Flores, and one in the collection of Canon Tristram from Lombock is intermediate between *E. orientalis* and *E. pacificus*, but resembles the latter species much more closely than it does the former. Canon Tristram records the present species from the Louisiade and d'Entrecasteaux Islands off New Guinea; but in the Solomon Islands, New Britain, and New Ireland it is replaced by *Eurystomus salomonensis* and *E. crassirostris*. As above stated, Salvadori thinks it probable that it inhabits the island of Waigiou, but the only Roller I have seen from there is referable to *Eurystomus crassirostris*.

I have examined many examples of the present species of Roller from New Guinea and also from Australia, where, according to Mr. Gould, it "would appear to be a very local species, for I have never seen it from any other part of the country than New South Wales; but the late Mr. Elsey informed me that he found it very common in the Victoria basin, and that it became very numerous about the head of the Lynd." According to Mr. Ramsay it is apparently plentiful in certain seasons at Port Denison, and he received sterna of specimens obtained there in October and December. He also adds that it is plentiful about the township of Cardwell and elsewhere. It has also been recorded from New Zealand by Mr. Cheeseman, who states (*l. c.*) that a specimen was shot at Piku, eight miles north of the Manukau Heads, this being the first record of its occurrence in New Zealand.

The best account I can find of its habits is that given by Mr. Gould, who, in his 'Birds of Australia,' writes as follows:—"It arrives early in the spring, and after having brought forth its progeny retires northward on the approach of winter. It appeared to be most active about sunrise and sunset; in sultry weather it was generally perched upon some dead branch in a state of quietude. It is a very bold bird at all times, but particularly so during the breeding-season, when it attacks with the utmost fury any intruder that may venture to approach the hole in the tree in which its eggs are deposited. When intent upon the capture of insects it usually perches upon the dead upright branch of a tree growing beside and overhanging water, where it sits very erect, until a passing insect attracts its notice, when it suddenly darts off, secures its victim, and returns to the same branch; at other times it may constantly be seen on the wing, mostly in pairs, flying just above the tops of the trees, diving and rising again with many rapid turns. During flight the silvery-white spot in the centre of each wing shows very distinctly, and hence the name Dollar Bird bestowed upon it by the colonists.

"It is a very noisy bird, particularly in dull weather, when it often emits its peculiar chattering note during flight. It is said to take young Parrots from their holes and kill them, but this I never witnessed; the stomachs of the many I dissected contained the remains of Coleoptera only. The breeding-season lasts from September to December; and the eggs, which are three and sometimes four in number, are deposited in the hole of a tree without any nest; they are of a beautiful pearly white, considerably pointed at the smaller end; their medium length is one inch and five lines, and breadth one inch and two lines.

"The sexes are alike in plumage."

Latham's original description of this Roller is very far from satisfactory, and on this ground some naturalists have discarded the specific title given by him in favour of *australis* of Swainson; but, as will be seen by the synonymy, most authorities agree in retaining Latham's name, which appears to be the proper course, for Latham gives the habitat as New Holland, where no other Roller is found, and there can therefore be no doubt that he refers to the present species, and it would therefore be pure pedantry to discard his name for that given by Swainson.

The specimens figured and described, with the exception of the young bird figured, are all in my own collection.

In the preparation of the above article I have, besides the series in the British Museum, examined the following specimens:—

E Mus. H. E. Dresser.

a, ♂ ad. South Queensland (*Gerrard*). *b*, ♀ ad. Ceram (*A. R. Wallace*). *c*, ♀. Flores, 1862 (*A. R. Wallace*).
d, e, f, g, h, i, ad.; *j, k*, juv. New Guinea (*A. Linden*).

E Mus. H. B. Tristram.

a. Australia. *b*. Norfolk Island, 1886 (*P. H. Metcalfe*). *c*, ♂. Dodinga, Halmahera, 21st April, 1862 (intermediate between *E. orientalis* and *E. pacificus*) (*Bernstein*). *d*, ♂. N. Ceram, 1860 (*A. R. Wallace*).
e, ♀. Lomboek, 1856 (*A. R. Wallace*).

EURYSTOMUS CRASSIROSTRIS.

NEW-GUINEA BROAD-BILLED ROLLER.

Eurystomus crassirostris, Sclater, P. Z. S. 1869, p. 121 ; Elliot, Ibis, 1871, p. 204 ; Sharpe, tom. cit. p. 185 ; Salvad. & D'Albert. Ann. Mus. Civic. Genov. vii. p. 814 (1875) ; Ramsay, Proc. Linn. Soc. N. S. W. i. p. 389 (1876) ; Salvad. op. cit. p. 19 (1876), pp. 125, 308 (1877) ; Sclater, P. Z. S. 1877, p. 106, 1878, p. 671 ; Sharpe, Journ. Linn. Soc. xiii. p. 493 (1878) ; Ramsay, Proc. Linn. Soc. N. S. W. iii. p. 263 (1878), iv. p. 71 (1879) ; Finsch, P. Z. S. 1879, p. 10 ; Sharpe, Journ. Linn. Soc. xiv. p. 686 (1879) ; Salvadori, Orn. Papuas. &c. i. p. 510 (1880, pt.) ; Layard, Ibis, 1880, p. 300 ; Finsch, Ibis, 1881, p. 536 ; Ramsay, Proc. Linn. Soc. N. S. W. vii. p. 20 (1882) ; Finsch, Vög. der Südsee, p. 25 (1884) ; Guillemard, P. Z. S. 1885, p. 629 ; Nehrkorn, J. f. O. 1885, p. 32 ; Salvadori, Agg. Orn. Papuas. &c. i. p. 61 (1889, pt.) ; Sharpe, Cat. B. Brit. Mus. xvii. p. 39 (1892).

Eurystomus waigiouensis, Elliot, Ibis, 1871, pp. 203, 204.

Kalangbabareta, in the Duke of York Islands (*fide* Finsch).

Figura nulla.

HAB. New Britain, New Ireland, New Guinea and the adjacent islands, New Hebrides.

Ad. E. orientalis similis, sed coloribus lætioribus et rostro majore dorso saturatè virescente : caudâ magis ultramarino lavatâ, remigibus primariis in pogonio externo lætè ultramarinis et secundariis eodem colore marginatis : rostro aurantiaco-rubro, culmine nigro apicato : pedibus aurantiaco-rubris : iride fuscâ.

Adult male (New Britain).—Resembles *Eurystomus orientalis*, but larger in size, with a larger and broader bill ; in general coloration much richer ; back greener ; tail of a deeper blue, the dark blue extending nearly to the tip of the tail : bill deep orange, feet reddish, iris drab (*Brown*) ; bill very bright orange-red, feet orange-red, iris red (*D'Albertis*). Total length about 12 inches, gape 1·75, wing 7·9, tail 4·6, tarsus 0·75.

THE present species of Broad-billed Roller inhabits New Britain, New Ireland, New Guinea, and many of the islands in the vicinity of the latter. There is in the Tweeddale collection a specimen marked “Nicobars” without any authority, but I cannot help thinking that there must be some mistake in the locality assigned to this specimen. Salvadori gives its range as “Duke of York Islands (*Brown, Hueska*) ; Yule Island, New Guinea, prope insulam Yule (*D'Albertis*) ; Dorei, Andai, Mansinam, montibus Arfakiensis (*Bruijn*) ; Sorong (*D'Albertis*) ; Wa-Samson (*Beccari*) ; Waigiou, Mysol (*Wallace*).” He further adds that he has examined the type of *Eurystomus waigiouensis* and has no hesitation in referring it to the present species. To the above I may add that Dr. Finsch

records it from the Duke of York Islands, Layard from the New Hebrides, and Nehrkorn from the island of Waigiou.

As regards the habits and nidification of the present species I find nothing on record, but it doubtless assimilates closely therein to its near ally, *Eurystomus orientalis*.

I have not deemed it necessary to figure this species, as there is no difference whatever between it and *Eurystomus salomonensis*, except that the present species has a black tip to the culmen, whereas in *E. salomonensis* it is entirely red.

The specimen described is in my own collection.

In the preparation of the above article I have, besides the series in the British Museum, examined the following specimens:—

E Mus. H. E. Dresser.

a, ♂. Blanche Bay, New Britain, 14th June, 1879 (*Gerrard*). *b*. New Ireland (*Gerrard*). *c, d*, ad. Astrolabe Mountains, New Guinea (*A. Goldie*).

E Mus. H. B. Tristram.

a. Fly river, New Guinea, 1877 (*W. G. Laws*).



J. G. Keulemans lith.

Hanhart. imp.

SOLOMON ISLAND BROAD-BILLED ROLLER.
EURYSTOMUS SALOMONENSIS.

EURYSTOMUS SALOMONENSIS.

SOLOMON ISLAND BROAD-BILLED ROLLER.

Eurystomus crassirostris (nec Selater), Gray in Brenchley's 'Cruise of the Curaçoa,' p. 358 (1873); Tristram, Ibis, 1882, p. 143; Grant, P. Z. S. 1887, p. 330, 1888, p. 194.

Eurystomus solomonensis, Sharpe, P. Z. S. 1890, p. 552; id. Cat. B. Brit. Mus. xvii. p. 40, pl. iii. fig. 1.

Eurystomus salomonensis, Sharpe, Dresser, Ibis, 1891, p. 102.

Figuræ notabiles.

Brenchley, 'Cruise of the Curaçoa,' pl. iii.; Sharpe, Cat. B. Brit. Mus. xvii. pl. iii. fig. 1.

HAB. Solomon Islands.

Ad. Eur. crassirostri similis, sed rostro omnino rubro, culmine nec nigro apicato.

Adult male (Guadalcanar, Solomon Islands).—Similar to *Eurystomus crassirostris*, but has the entire bill red, without any black at the tip of the culmen. Total length about 12·5 inches, gape 1·6, wing 7·9, tail 5·15, tarsus 0·75.

THE present species has recently been separated from *Eurystomus crassirostris* by Dr. Sharpe, the only difference being that the former has the bill entirely red, whereas in *E. crassirostris* it is red with a blackish tip to the culmen. The difference is so slight that I have some doubts as to the propriety of recognizing it as a valid species; but all the specimens I have had an opportunity of examining from the Solomon group have the culmen entirely red, whereas those from other localities have it tipped with black, and I therefore have deemed it advisable to follow Dr. Sharpe's example and separate the two forms.

So far as is yet known, the present species is only found on the islands belonging to the Solomon group; Canon Tristram records it as having been met with on San Cristoval, Ugi Island, Guadalcanar, and Savo; Brenchley obtained it on Ugi Island in August; and there is a specimen in the British Museum from Alu obtained by Mr. C. M. Woodford.

Respecting the habits or nidification of the present species there is nothing on record.

The specimen figured and described is in my own collection.

In the preparation of the above article I have, besides the series in the British Museum, examined the following specimens:—

E Mus. H. E. Dresser.

a, ♂ ad. Guadalcanar, Solomon Islands, 21st March, 1877 (*G. E. Richards, R.N.*).

E Mus. H. B. Tristram.

a, ad. Guadalcanar, Solomon Islands, 21st March, 1877 (*G. E. Richards, R.N.*).



J. G. Keulemans lith.

Hanhart imp.

AZURE BROAD-BILLED ROLLER.
EURYSTOMUS AZUREUS.

EURYSTOMUS AZUREUS.

AZURE BROAD-BILLED ROLLER.

Eurystomus azureus, G. R. Gray, Proc. Zool. Soc. 1860, p. 346; Finsch, Neu-Guinea, p. 160 (1863); Schlegel, Mus. Pays-Bas, *Coraces*, p. 141 (1867); G. R. Gray, Hand-l. of B. i. p. 76, no. 908 (1869); Sharpe, Ibis, 1871, p. 185; Elliot, Ibis, 1871, p. 204; Giebel, Thes. Orn. ii. p. 145 (1874); Salvadori, Ann. Mus. Civ. Gen. x. p. 308, no. 4 (1877); id. Orn. Papuas. i. p. 512 (1880); Guillemard, Proc. Zool. Soc. 1885, p. 569; Salvadori, Agg. Orn. Papuas, pt. i. p. 61 (1889); Sharpe, Cat. B. Brit. Mus. xvii. p. 40, pl. iii. fig. 2 (1892).
Eurystomus orientalis, Meyer, Orn. Mitth. p. 17 (1875, partim).

Figura unica.

Sharpe, Cat. B. Brit. Mus. xvii. pl. iii. fig. 2.

HAB. Islands of Batchian and Halmahera.

Ad. splendide ultramarinus, corpore supra saturatiore et capite nigro-ultramarino; gulâ vix pallidior et cyaneo striatâ: remigibus primariis in pogonio interno nigro marginatis et plagâ pallidâ cæruleâ ad basin notatis: rostro et pedibus rubris: iride fuscâ.

Adult male (Batchian).—Rich deep cobalt or ultramarine-blue, upper parts darker, and the head blackish blue; throat rather paler and striped with very pale blue; quills rich ultramarine-blue, the primaries slightly margined with black on the inner webs; a light blue patch on the basal part of the primaries: bill and legs pale vermilion-red, with a slight orange tinge; iris brown. Total length about 11·5 inches, gape 1·65, wing 7·9, tail 4·5, tarsus 0·72.

THE present species, one of the richest coloured of the Rollers, is only known as an inhabitant of the Moluccas, where it has been obtained on the islands of Halmahera and Batchian. First discovered by Mr. A. R. Wallace on Batchian, it has since but seldom been obtained, and is consequently still a very rare bird in collections. Schlegel states (*l. c.*) that in the Leyden Museum there are specimens obtained by Bernstein in Batchian and at Bessa on the north-east coast of Halmahera, and Dr. Guillemard, who obtained one near the village of Batchian in the month of December, remarks that it was regarded by the natives as very rare.

So little is known respecting this bird that there is absolutely nothing on record regarding its habits or nidification, but it probably does not differ in these from the rest of the *Eurystomi*.

The specimen figured is in my own collection.

In the preparation of the above article I have examined the following specimens:—

E Mus. H. E. Dresser.

a, ♂ ad. Batchian (*Gerrard*).

E Mus. Brit.

a, ♀ ad.; *b*, immature; *c*, ad. Batchian (*A. R. Wallace*).

SUBFAMILY BRACHYPTERACIINÆ.

GENUS BRACHYPTERACIAS.

Colaris, Less. (nec Cuv.), Illustr. Zool. pl. 20 (1832). Type *Colaris leptosomus*.

Brachypteracias, Lafr. Mag. de Zool. 1834, clii. pl. 31. Type *C. leptosomus*, Less.

Chloropyga, Swainson, Classif. of B. ii. p. 333 (1837). Type *C. leptosomus*, Less.

Atelornis, Pucheran, Rev. Zool. 1846, p. 193, partim.

Geobiastes, Sharpe, Ibis, 1871, p. 281. Type *B. squamigera*, Lafresnaye.

HAB. Madagascar.

Rostro longo, validiusculo, decurvato, hamato: alis brevibus, remigibus quartâ et quintâ longissimis, primâ 1'' quam secunda et ferè 2'' quam quarta brevior: caudâ longâ, rotundatâ: pedibus longis, robustis.

Bill long and stout, corvine in shape; culmen rounded and slightly hooked at the tip; nostrils near the base of the upper mandible and covered by bristly feathers; a bare space behind the eye. Wings short and broad, the fourth and fifth quills longest, the first quill 1 inch shorter than the second and nearly 2 inches shorter than the fourth. Tail long, rounded. Tarsus stout, elongated, scutellated in front; feet anisodactyle, the outer toe united to the middle toe at the extreme base; claws moderately stout, curved, compressed, acute. Sexes similar in coloration.—Type *Brachypteracias leptosomus*.

THE present genus contains only two species, and is confined to Madagascar. In their habits they are terrestrial, only occasionally perching on low trees, and inhabit the dense forest: by some explorers they are said to be seldom seen during the daytime, but only early in the morning and late in the evening. Their flight is heavy and spasmodic, and they are not often seen on the wing. Nothing definite is yet known respecting their nidification. They feed on insects and small reptiles.



J.G.Keulemans lith.

Hanhart imp.

SHORTLEGGED PITTA ROLLER.
BRACHYPTERACIAS LEPTOSOMUS.

BRACHYPTERACIAS LEPTOSOMUS.

SHORT-LEGGED PITTA-ROLLER.

Colaris leptosomus, Less. Illustr. de Zool. pl. 20 (1832).

Brachypteracias leptosomus (Less.), Lafr. Mag. de Zool. 1834, Ois. cl. ii. pl. 31; Gray, Gen. of B. i. p. 61 (1845); id. Cat. Fiss. Brit. Mus. p. 35 (1848); Bonap. Consp. Gen. Av. i. p. 166 (1850); Reichenb. Meropinæ, p. 53, pl. 436. figs. 3191–92 (1852); Bp. Consp. Volucr. Anis. p. 7 (1854); von Müller, Journ. f. Orn. 1855, p. 5; Hartlaub, Journ. f. Orn. 1860, p. 83; id. Orn. Madag. p. 28 (1861); E. Newton, Ibis, 1863, p. 341; Verr. in Vins. Voy. Madag. Ann. B (1865); Grandidier, Rev. et Mag. de Zool. 1867, p. 354; Schlegel & Poll. Faun. Madag. p. 158 (1868); Sharpe, P. Z. S. 1870, p. 398; id. Ibis, 1871, p. 280; Hartl. Vög. Madag. p. 70 (1877); Milne-Edw. & Grandidier, H. N. Madag., Ois. i. p. 235, pls. 96, 96a, 97–99 (1879); Sharpe, Cat. B. Brit. Mus. xvii. p. 5 (1892).

Chloropygia leptosomus (Less.), Swainson, Classif. of B. ii. p. 333 (1837).

Brachypteracias collaris, Pucheran, Rev. Zool. 1846, p. 199; id. Arch. Mus. iv. p. 343 (1849).

Brachypteracias leptosoma (Less.), Gray, Hand-l. of B. i. p. 177, no. 913 (1869).

Figuræ notabiles.

Lesson, Illustr. de Zool. pl. 20; Lafresnaye, Mag. de Zool. 1834, Ois. pl. 31; Reichenbach, Meropinæ, pl. 436. figs. 3191, 3192; Milne-Edw. & Grand. Hist. Nat. Madag., Ois. pl. 96.

HAB. Madagascar.

♂ *ad.* capite et nuchâ castanco-fuscis, pileo postico et nuchâ ultramarino tinctis: striâ supraciliari albâ et facie lateribus albo guttatis: suprâ olivaceo-fuscus viridi lavatus: uropygio et supracaudalibus viridi-cyaneo tinctis: remigibus fuscis, in pogonio interno ad basin albis et in pogonio externo fulvido marginatis: primariis intimis in pogonio externo ad basin albo transfasciatis: secundariis intimis viridi lavatis: tectricibus majoribus fasciâ subapicali albâ notatis: caudâ rufescenti-fuscâ, rectricibus (duabus centralibus exceptis) cæruleo-nigro subterminatis et albo apicatis: gulæ plumis sordidè castaneis, centraliter pallidioribus et albido terminatis: pectore conspicuè albo transfasciato, corpore reliquo albo-castaneo et nigro fasciato, sed abdomine centraliter et subcaudalibus cervino-albidis: rostro nigro-corneo: pedibus griseo-rosaceis: iride fuscâ.

♀ *ad.* mari similis.

Pull. ubique coloribus sordidioribus: rostro nigricante albo-corneo terminato: capite rufescente fusco nec ultramarino lavato: dorso rufescenti-fusco lavato: pilei plumis indistinctè albo apicatis: corpore subtùs sordidè rufescenti-cervino, fusco notato, gulâ saturatiore, abdomine imo et subcaudalibus ferè albis, fasciâ pectorali indistinctâ et sordidè albido-cervinâ nec albâ.

Adult male (Madagascar).—Head and neck glossy chesnut-brown; hind crown and nape glossed with rich ultramarine; a slight central stripe on the forehead and an irregular stripe from the bill over the eye white; sides of the head spotted with white; upper parts generally olivaceous brown, washed with green; rump and upper tail-coverts blue-green; quills brown, white on the base of the inner web, and externally margined with fulvous, some of the inner primaries with a white bar at the base of the outer web, inner secondaries washed with green on the inner web; larger wing-coverts with a subterminal white bar; tail reddish brown, all except the two central feathers with a subterminal bluish-black band and broadly tipped with white; throat dull chestnut, the feathers tipped with white and with a paler centre; a broad crescentic white band across the breast; rest of the

underparts white, banded with chestnut and to some extent with blackish; centre of the abdomen and under tail-coverts creamy white; under wing-coverts white, mottled with brown: bill blackish horn; legs rosy grey; iris brown. Total length about 12 inches, culmen 1.55, wing 5.9, tail 4.6, tarsus 1.4.

Adult female (Madagascar).—Similar to the male.

Nestling (Madagascar).—Upper parts browner than in the adult, without any trace of the rich blue on the head; feathers on the crown with minute white terminal dots; underparts dull rufous buff, darker on the throat, whiter in an indistinct band across the breast, and becoming nearly white on the lower abdomen and under tail-coverts; most of the feathers darker at the tip, giving the underparts the appearance of having blurred cross-bars; tail and wings as in the adult, but much duller, the former very short and the latter without any trace of blue.

FIRST obtained in Madagascar by Dr. Ackerman, a surgeon in the French Navy, and described by Lesson in 1832 from a specimen in the Rivoli collection, this Roller is still a rare bird in collections. Sir E. Newton in 1863 cites a specimen as having been obtained by Capt. Anson near Ampasimbé on his return from Antananarivo; and according to Grandidier it inhabits the forests on the eastern side of Madagascar, especially those in the north-east of that island, but it is a rare bird.

With regard to its habits I find nothing on record beyond what is given (*l. c.*) by Grandidier, who says that it frequents humid, out-of-the-way places in forests, where it may be met with in the morning or evening either singly or, during the breeding-season, in pairs. It is usually to be found on the ground, where it scratches, like the gallinaceous birds, amongst the moss and dead leaves in search of its food, which consists of insects, ants, larvæ, caterpillars, &c., and also of small reptiles. Occasionally this species perches on the low branches of shrubs, but is seldom seen on the wing, and its flight is heavy and spasmodic.

Nothing appears to be on record respecting its nidification, but I am indebted to the Rev. J. Wills for the following note:—"A native assures me that he has seen the nest of this bird. It was, he says, in a shallow hole in a tree-trunk, about a man's height from the ground, and the bird sat with its neck and head outside the hole. Two of my native friends who have shot *B. leptosomus* say that it was on the ground when they first saw it, and it then flew up into a tree and hid behind the branches, so that it was most difficult to get a sight of it, and they added that it will remain until the branch is shaken. I gather that both this species and *B. squamiger* are supposed to hibernate, for, when I was in the East Forest in August last, I enquired of the natives about these two large Rollers, and the reply was that 'they had not yet come out of their holes.'"

The adult male figured and described is in my own collection, and the descriptions of the adult female and nestling are taken from specimens in the collection of Messrs. A. & E. Newton.

In the preparation of the above article I have examined, besides the series in the British Museum, the following specimens:—

E Mus. H. E. Dresser.

a, ♂ ad.; *b*, ad. Madagascar (*Whitely*).

E Mus. A. & E. Newton.

a, ♂ ad. Madagascar. *b*, ♀ ad. Madagascar, September 1861 (*Capt. Anson*). *c*, pull. Madagascar (*Watkins*).

E Mus. W. Rothschild.

a, *b*, *c*, ad. Madagascar (*Boucard*).



J. G. Keulemans lith.

Hanhart imp.

SCALY PITTA ROLLER.
BRACHYPTERACIAS SQUAMIGER.

BRACHYPTERACIAS SQUAMIGER.

SCALY PITTA-ROLLER.

Brachypteracias squamigera, Lafr. Rev. Zool. 1838, p. 224; Puch. Rev. Zool. 1846, p. 193; Bp. Consp. Gen. Av. i. p. 166 (1850); von Müller, Journ. f. Orn. 1855, p. 6; Grandidier, Rev. et Mag. de Zool. 1867, p. 354; Schlegel, Mus. Pays-Bas, *Coraces*, p. 138 (1867); Schlegel & Poll. Faun. Madag. p. 158 (1868); Gray, Hand-l. of B. i. p. 77, no. 915 (1869); Milne-Edw. & Grandidier, Hist. Nat. Madag., Ois. i. p. 241, pls. 96*a*, 99–102 (1879).

“*Brachypteracias squammigera*, Lafr.,” Pucheran, Rev. Zool. 1846, p. 193.

Atelornis squamigera (Lafr.), Des Murs, Iconogr. Orn. pl. xxxix. (1846); Reichenb. Meropinae, p. 53, pl. 436. fig. 3194 (1852); Bp. Consp. Volucr. Anisod. p. 7 (1854); Hartlaub, Journ. f. Orn. 1860, p. 84; id. Faun. Madag. p. 28 (1861); Verr. in Vins. Voy. Madag. Ann. B (1865).

Geobiastes squamigera (Lafr.), Sharpe, Ibis, 1871, p. 281; id. P. Z. S. 1871, p. 316; Hartl. Vög. Madag. p. 72 (1877); Sharpe, Cat. B. Brit. Mus. xvii. p. 6 (1892).

Figuræ notabiles.

Reichenbach, Meropinae, pl. 436. fig. 3194; Milne-Edw. & Grandidier, Hist. Nat. Madag., Ois. pl. 100.

HAB. Madagascar.

Ad. capite et collo pallidè cervino-fuscis nigro transfasciatis vel squamatis: striâ centraliter in pileo usque ad nucham ductâ, striâ pone oculum et striâ suboculari ad nucham nigris: nuchâ posticâ et dorso antico rufescentibus: corpore reliquo suprâ cum tectricibus alarum viridi-olivaceis albo et nigro transfasciatis: rectricibus centralibus viridi-rufescentibus, versûs apicem magis viridi tinctis: rectricibus reliquis ad basin et apicibus cæruleis, et centraliter rufescenti-aurantiacis, nigro subterminatis: remigibus nigricantibus, primariis ad basin cervino-albido fasciatis et griseo-fusco terminatis: pectore et hypochondriis cervino-albidis nigro transfasciatis, sed abdomine imo pallidè cervino nec fasciato: subcaudalibus albis: rostro corneo-fusco: pedibus corneo-fuscis: iride rufescenti-fuscâ.

Adult male (Madagascar).—Head and neck dark buffy white, closely cross-barred with black; a broad black stripe passing through the centre of the crown to the nape, where it broadens and is joined by a stripe passing from the back of the eye and another from below the eye; hind neck and fore part of the back bright bay; rest of the upper parts olivaceous green, brighter on the wings, the interscapular region slightly and the wing-coverts more profusely barred with white and black; central rectrices greenish bay, greener towards the tip; remaining tail-feathers bright blue at the base, pale blue at the tip, otherwise bay with a broad subterminal black band; quills black, with a buffy white band at the base of the primaries and pale greyish brown at the tip; underparts generally buffy white, closely barred or squamated with black, excepting on the lower abdomen, where it is pale buff, barred only on the sides; under tail-coverts white: bill brownish horn; legs fleshy brown; iris reddish brown. Total length about 10 inches, culmen 1·5, wing 5, tail 4·25, tarsus 1·95.

Young (*fide* Pucheran, Rev. Zool. 1846, p. 196).—Generally rufescent, but of a duller and darker tint on the head, interscapular region, and neck. In all these parts the feathers are deep black at the base; on the chin, however, they are white at the root; below the eye and the forehead there are zones barred with white, dark reddish, and brown, and behind and somewhat below the eye there is a small black spot; the sides of the throat are of a lighter red than the head and the lower neck; the feathers are centrally marked with white, red, and brown, and some few have the flanks thus marked; the remainder is smoky brown, tinged with rufous; the abdomen is downy white; there is no peculiarity in the coloration of the quills, but the wing-coverts are of a darker green, more rufous and more brown than in the adult, and the terminal spot is composed of two bands, the lower one blackish brown, the upper one rufescent white, margined with blackish brown, both above and below; the back is deep olivaceous brown; the plumage of this specimen is worn and loose: upper mandible dark brown, lower yellowish horn.

THE present species, which appears to be one of the rarest of the Rollers inhabiting Madagascar, was first obtained in 1834 by Goudot on the bank of the Tsimianonã river, south of the Point of Larrée, and was described in 1838 by Lafresnaye, the type being in the Paris Museum.

It inhabits, according to Grandidier, the vast forests on the eastern side of Madagascar, especially between Tamatave and Sambave, and in its habits it is similar to its congeners.

The natives informed Crossley that this species is nocturnal in its habits; but this is denied by Grandidier, who says that they meant that it is extremely rare. It is, he adds, by no means shy.

Respecting its general habits, I find nothing further on record, and its mode of nidification and its eggs appear to be as yet unknown.

The specimen figured and described is in my own collection.

In the preparation of the above article I have examined the following specimens:—

E Mus. H. E. Dresser.

a, ♂ ad. Madagascar (*Boucard*).

E Mus. A. & E. Newton.

a, ♂; *b*, ♀. Madagascar (*Gustav Schneider*).

E Mus. Brit.

a, ad. S.E. Madagascar. *b*, ad. S.E. Madagascar, February (*A. Crossley*). *c*, ♂ ad.; *d*, ♀ ad. S.E. Madagascar, February (*Audebert*).

E Mus. Rothschild.

a, *b*, ad. Madagascar (*Boucard*).

GENUS ATELORNIS.

Brachypteracias, Lafr. Rev. et Mag. de Zool. 1834, pl. 31, partim.

Atelornis, Pucheran, Rev. Zool. 1846, p. 200. Type *Brachypteracias pittoides*, Lafresnaye.

Corapitta, Bonap. Consp. Vol. Anisod. p. 7 (1854). Type *Brachypteracias pittoides*.

Coracopitta, *fide* Sharpe, Cat. B. Brit. Mus. xvii. p. 7 (1892).

HAB. Madagascar.

Rostro longo, gracile, versùs apicem decurvato : alis brevibus, remige quartâ longissimâ, tertiâ vix brevior, primâ 0"·7 quam secunda et 1" quam quarta brevior, tertiâ et quintâ æqualis : caudâ longâ, rotundatâ : tarsis elongatis, gracilibus.

Bill rather long and slender, slightly decurved towards the tip ; nostrils basal, linear, partly concealed by feathers ; no bare space below the eye. Wings short and broad, the fourth quills longest, the third but a trifle shorter, the first 0·7 inch shorter than the second and 1 inch shorter than the fourth, the third and fifth about equal in length. Tail long, rounded. Legs long and rather slender ; feet rather slender ; claws rather short than otherwise, curved, acute.—Type *Atelornis pittoides*.

THE present genus contains two, or possibly three, species, which are restricted to Madagascar. In habits they are terrestrial and are but seldom seen on the wing, and their flight is feeble. They are said to be to a great extent crepuscular. They feed on insects and small reptiles. They nest in holes in the ground or between the roots of large trees, and deposit creamy-white eggs or white slightly spotted at the smaller end.



J.G. Keulemans lith.

Hanhart imp.

BLUEHEADED GROUND ROLLER.
ATELORNIS PITTOIDES.

ATELORNIS PITTOIDES.

BLUE-HEADED GROUND-ROLLER.

Brachypteracias pittoides, Lafr. Mag. de Zool. 1834, clii. pl. 32; Gray, Gen. of B. i. p. 62 (1845); id. Cat. Fiss. Brit. Mus. p. 35 (1848); Bonap. Consp. Gen. Av. i. p. 166 (1850); von Müller, Journ. f. Orn. 1855, p. 6; Schlegel, Mus. Pays-Bas, *Coraces*, p. 138 (1867); Grandidier, Rev. et Mag. de Zool. 1867, p. 354; Schlegel & Poll. Faun. Madag., Ois. p. 158 (1868); Milne-Edw. & Grandid. H. N. Madag., Ois. i. p. 244, pls. 103 *a*, *b*, 104, 104 *a* (1879).

Atelornis pittoides, Pucheran, Rev. Zool. 1846, p. 200; Reichenbach, Meropinae, p. 53, pl. 436. fig. 3193 (1852); Hartlaub, Journ. f. Orn. 1860, p. 84; id. Orn. Madag. p. 28 (1861); Roch & Newton, Ibis, 1862, p. 271, pl. ix.; E. Newton, Ibis, 1863, p. 341; Verr. in Vins. Voy. Madag. Ann. B (1865); Sharpe, Proc. Zool. Soc. 1870, p. 398; id. Ibis, 1871, p. 283; Hartl. Vög. Madag. p. 74 (1877); Bartlett, Proc. Zool. Soc. 1879, p. 771; Sharpe, Cat. B. Brit. Mus. xvii. p. 7 (1892).

Corapitta pittoides (Lafr.), Bonap. Consp. Volucr. Anis. p. 7 (1854).

Brachypteracias (Atelornis) pittoides (Lafr.), Gray, Hand-l. of B. i. p. 77, no. 914 (1869).

Roa-Telo, Reningaly, Voronsikinanä, Sakòka, in Madagascar.

Figuræ notabiles.

Lafresnaye, Mag. de Zool. 1834, Ois. pl. 32; Reichenbach, Meropinae, pl. 436. fig. 3193; Roch & E. Newton, Ibis, 1862, pl. 9; Milne-Edw. & Grand. Hist. Nat. Madag., Ois. pl. 104.

HAB. Madagascar.

Ad. pileo et nuchâ saturatè ultramarinis, lateribus albo guttatis, striâ superciliari formante: loris, facie lateribus et regione paroticâ saturatè nigris: collo postico et dorso superiore rufescenti-fuscis: dorso reliquo et alis suprâ psittaeino-viridibus, supracaudalibus olivaceo lavatis: tectricibus alarum majoribus ultramarino lavatis, tectricibus primariis nigris: remigibus nigricantibus versùs apicem fusco tinctis et primariis ad basin in pogonio externo albis, secundariis viridi lavatis: rectricibus centralibus olivaceo-fuscis, reliquis saturatè ultramarinis: gulâ et gutture albis, ultramarino circumeinctis: pectore et hypochondriis pallidè castaneis: corpore reliquo subtùs cervino-albido: rostro nigro: pedibus griseis: iride fuscâ.

Juv. ubique sordidior, fronte et superciliis rufescenti-cervino lavatis et guttatis: gulâ nigricante notatâ et gulæ lateribus rufescenti-cervino notatis.

Adult male (Madagascar).—Crown and nape rich cobalt; the feathers over the eye and ear spotted with white, forming a long superciliary stripe; lores, cheeks, and ear-coverts deep black; back of the neck and upper back brownish rufous, rest of the back and wing-coverts grass-green, the upper tail-coverts tinged with olive; larger wing-coverts washed with cobalt; primary-coverts black; quills black, running into brown towards the tip, white at the base of the inner web; the primaries white

also at the base of the outer web, forming a white alar patch; secondaries washed with grass-green; central tail-feathers olive-brown, the remainder deep cobalt; throat pure white, bordered by a broad patch of cobalt-blue, which extends from below the eye to the upper breast, where it forms a band across the lower throat; breast and flanks bay; rest of the underparts creamy white: beak black; legs grey; iris brown. Total length about 10 inches, culmen 1·2, wing 4·6, tail 4·8, tarsus 1·7.

Female.—Similar to the male, but rather duller in tinge of colour.

Young female (Madagascar).—Resembles the adult, but much duller in general coloration, on the forehead and above the eyes marked with brownish buff, the spots over the eye and ear few in number and pale buff, not white; throat marked with blackish, and the sides of the neck slightly marked with rufous buff.

Obs.—In the specimens before me the amount of cobalt-blue on the sides of the throat and neck varies considerably in extent. In some, evidently old birds, it extends only on the sides, the white being continued right down to the breast, whereas in others it is continued right across the lower throat, and this is also the case in the young female which I have figured and described. I have therefore deemed it best to figure this extreme form, as in Messrs. Roch and Newton's plate the form is figured in which the blue extends only on the sides of the throat.

LIKE the other aberrant Rollers to which it is allied, the present species is confined to Madagascar, where it was first discovered in 1834 by Bernier, and described by Lafresnaye the same year, the type being in the Paris Museum.

It inhabits the large forests on the eastern side of Madagascar, at least from Mangoro to Sambasa, and appears to be tolerably common. Messrs. Roch and Newton, who met with it in the forest of Alanamasatra (which is, the latter gentleman remarks, the only locality from which he heard of it), write (*l. c.*):—"It was getting dark as we approached Alanamasatra on our journey up, when we saw several of these birds run across the path; one of them was shot by Dr. Roch. On our return we saw one again, but it was only in the dusk of the evening. It is singular that such a brightly coloured species should only appear at nightfall, as it would seem alone to do. They have a very peculiar manner of jerking their tails when they alight on a branch. As far as we observed, they always kept very near the ground, and are probably ground-feeders."

The Rev. J. Wills, from whom I received several specimens of this Roller, tells me that it is seldom seen except in the dusk of the evening, and appears to be crepuscular in its habits and essentially a ground-frequenting species. He tells me also that it nests in holes in the ground, but that he had not obtained its eggs. Grandidier also states that it nests in the ground or between the roots of large trees, and from this habit the belief is derived that it hibernates, for he says "the natives assert that these birds hibernate during the dry season, like the *Trandrakā* (*Centetes*), in holes dug in the ground." He describes the egg as being "white with a few small spots at the smaller end, and large for the size of the bird, measuring 37 by 27 millimetres; but according to Bartlett (*P. Z. S.* 1879, p. 770) "the eggs are creamy white, with a smooth surface, but not so highly polished as the eggs of *Coracias garrulus*." According to Grandidier, the Betsimisaraka's call this bird, according to locality, *Roa-Telo*, *Reningaly* (mother of Nectarineas), or *Voronsikinanā* (rich-plumaged bird).

In a letter just received from the Rev. J. Wills, who writes from Antananarivo, he sends me the following note:—"The cry of *A. pittoides* is indicated by its native name *Sakòka*. The *sa* is scarcely sounded, and the final *a* is almost silent; the *ò* is lengthened and becomes *köök*; and the call is loud, almost like a man's shout. Natives who have dug out the nests inform me that the nest is at the end of a hole extending in the ground to about the length of a man's arm. The hole is made in a bank of soft earth, very round and smooth, and too small to admit a man's hand. They are all about the same size, and the loose earth found below the entrance shows that the bird excavates its own nest-hole, and does not make use of one already bored. The nest-hole and nest are clean, and not like those of the Kingfisher. The hole is enlarged at the end and basin-shaped, and the eggs, which are pure white, about equal in size to those of a Quail, and two in number, are deposited on a little dry grass. One of my friends, however, tells me that he found two eggs which were spotted with brown, but he was uncertain as to whether the nest was that of *A. pittoides* or *A. crossleyi*. The nest of this species has only one hole for ingress and egress."

The specimens figured are an adult male in the foreground and a young female in the background, these and the specimens described being in my own collection.

In the preparation of the above article I have examined, besides the series in the British Museum, the following specimens:—

E Mus. H. E. Dresser.

a, ♀ juv.; *b*, ♂ ad.; *c*, ad. Madagascar (*Whitely*). *d*, ♂ ad.; *e*, ♂ ad.; *f*, ♀. Imerina, Madagascar, 1884 (*Rev. J. Wills*).

E Mus. A. & E. Newton.

a, ad. Madagascar, September 1862 (*Capt. Anson*). *b*, ad. Madagascar, 1879 (*Watkins*).

E Mus. W. Rothschild.

a, *b*, ad.; *c*, ♂ juv. Madagascar. *d*, ♂ ad. Madagascar, 10th June, 1891.



J. G. Keulemans lith.

CROSSEY'S GROUND ROLLER.
ATELORNIS CROSSLEYI.

Hanhart imp.

ATELORNIS CROSSLEYI.

CROSSLEY'S GROUND-ROLLER.

Atelornis crossleyi, Sharpe, Proc. Zool. Soc. 1875, p. 74, pl. xiv.; Hartlaub, Vög. Madag. p. 7 (1877); Forbes, Proc. Zool. Soc. 1880, pp. 468, 472; Sharpe, Cat. B. Brit. Mus. xvii. p. 8 (1892).

Brachypteracias crossleyi (Sharpe), Milne-Edw. & Grandidier, Hist. Nat. Madag., Ois. i. p. 249, pls. 103, 103 b (1879).

Sakóka, *Vòrontràndraka*, in Madagascar.

Figuræ notabiles.

Sharpe, Proc. Zool. Soc. 1875, pl. xiv.; Milne-Edw. & Grand. Hist. Nat. Madag., Ois. i. pl. 103.

HAB. Madagascar.

Ad. capite sordidè castaneo, fronte et loris conspicuè pallidioribus: pileo postico saturatiore: nuchâ sordidè viridi: corpore et alis suprâ psittacino-viridibus: tectricibus alarum majoribus versùs apicem saturatè ultramarinis, extimâ versùs apicem albo notatâ: remigibus nigris, primariis ad basin in pogonio externo albis: rectricibus centralibus olivaceis, reliquis nigris viridi lavatis: subtùs castaneus, abdomine centraliter valdè pallidiore, hypochondriis viridi lavatis: gula plagâ magnâ nigrâ albo striatâ notata: rostro et pedibus nigris: iride fuscâ.

Adult male (Imerina).—Head rufous-bay, much paler on the forehead and lores, becoming darker on the hind crown and dull greenish on the nape and hind neck; back and upper surface of the wings deep parrot-green; larger wing-coverts becoming dull cobalt-blue towards the tips, the outermost with a terminal bluish-white spot; quills black, the primaries white at the base, forming a small white alar bar; chin, sides of the face, lower throat, and breast bay; throat with a large black patch striped with white; rest of the underparts dull ochreous, washed with green on the flanks, and much paler on the centre of the abdomen; central tail-feathers olivaceous black, the remainder black washed with green: bill and legs black; iris brown. Total length about 9·5 inches, culmen 1·1, wing 3·85, tail 4·7, tarsus 1·65.

Adult female.—Similar to the male.

BUT little is known respecting the present species of Roller. Mr. Crossley was the first to obtain it in Eastern Madagascar, and Grandidier states (*l. c.*) that whereas its congeners inhabit the forests on the northern portion of the eastern slopes of the large mountain-range in Madagascar, Crossley's Roller is only found in the southern portion. I may add that the two specimens in my collection

were obtained by the Rev. J. Wills in the forest east of Imerina, Central Madagascar—that is, the forest furthest from the east coast, and bordering the high tableland or plateau of Imerina, which is the home of the Hovas.

Respecting the habits of this Roller I find nothing on record, but Mr. Wills informs me that it is a forest-haunting species, and in its general habits resembles *A. pittoides*, and like that species is usually met with on the ground. It is said to nest in holes in the ground. In a letter just received, Mr. Wills adds that his native collector did not appear to have clearly distinguished the present species and *A. pittoides* and said that the cry and habits of the two species are alike. One native who brought him a specimen of *A. crossleyi* told him that, when obtained, the bird was flying amongst the trees, whereas *A. pittoides* rarely leaves the ground. The forest tribes, he adds, call the present species *Vòrontràndraka* or Hedgehog-bird, probably from its hibernating habits, but he could not ascertain whether they apply the same name to *A. pittoides*.

With regard to the statement that this species and *A. pittoides* hibernate, Mr. Wills writes to me as follows:—"During the winter months (May, June, July, and August) these two Rollers are not seen and the natives affirm that they remain then in their holes, but I can find no one who has actually seen them there. In the spring they reappear and are often seen until the winter again sets in. They may be seen flying about at all hours of the day and not only, as I before told you, towards the evening." This information is most interesting and reminds one of the now exploded, but once so prevalent idea that the Swallows did not migrate but hibernated; and it will be most important to have the matter thoroughly investigated, which Mr. Wills is now engaged in doing, and I trust ere long to have further information from him on the subject.

Rather more than a year ago the Rev. J. Wills gave me several Rollers he had collected in Madagascar, and amongst them were three which were stated to belong to the present species, two adult and one young bird. On carefully comparing them the two adults were found to be without doubt referable to *Atelornis crossleyi*, and the young bird also at the first glance appeared to belong to the same species, but all the new feathers appearing on the crown instead of being rufescent were rich cobalt-blue. I at once examined every specimen of *Atelornis crossleyi* I could find, and in every case they had the crown rufous-bay without any trace of blue, and the only inference at which I could arrive was that another undescribed species exists in Madagascar, which, when adult, has the crown rich cobalt-blue. On naming the matter to the Hon. Walter Rothschild, he told me that some time ago he purchased of a dealer an adult specimen of a Roller said to be *A. crossleyi*, with which it in fact agreed except that it had the entire crown rich cobalt-blue. This specimen is, however, not forthcoming, and Mr. Rothschild informs me that he has lost it. My specimen, which was obtained by the Rev. J. Wills at Imerina, Central Madagascar, resembles *A. crossleyi*, but is much duller in tone of plumage, the rich bay colour being replaced by dull rufescent ochraceous, the black and white patch on the throat is wanting, but there are one or two new feathers which are nearly white, showing that it would probably be assumed with the adult dress; the upper parts are duller than in *A. crossleyi* and the crown is dull rufous-brown varied with cobalt-blue, the new feathers being of this latter colour; the bluish-white spot on the wing-coverts is apparent, though but slightly developed. Total length about 9 inches, culmen 1.15, wing 3.55, tail 4.6, tarsus 1.65.

It is rather premature to describe a new species from a single immature specimen, but I think it advisable to propose the provisional name of *Atelornis cæruleiceps* should further research prove it to be a valid one, which I feel convinced will be the case. I wrote to Mr. Wills some time ago, asking him to make inquiries amongst the natives about this bird, and in a letter just to hand he replies as follows:—"I cannot yet throw any light on the blue-headed *crossleyi*, but I am assured by the

natives that there is another *Sakóka*, smaller than *A. crossleyi*, but I have not yet seen a specimen. I hope, however, to get one next spring."

The specimens of *Atelornis crossleyi* figured and described are in my own collection.

In the preparation of the above article I have examined, besides the two examples in the British Museum, the following specimens:—

E Mus. H. E. Dresser.

a, ♂ ad. Imerina, Madagascar, 1884. *b*. Ad. Imerina, September 1888 (*Rev. J. Wills*).

E Mus. A. & E. Newton.

a. Madagascar (*Crossley*). *b*. Within 40 miles of Antananarivo, Madagascar, 1881 (*Watkins*).

SUBFAMILY LEPTOSOMINÆ.

GENUS LEPTOSOMUS.

Cuculus, Herm. (nec Linn.) Tabl. Affin. Animal. p. 186 (1783).

Bucco, Steph. (nec Linn.) in Shaw's Gen. Zool. ix. p. 25 (1815).

Leptosomus, Vieill. Analyse, p. 28 (1816). Type *L. discolor*.

Crombus, Reichenb. Meropinae, p. 51 (1852). Type *L. discolor*.

HAB. Madagascar and some of the Comoro Islands.

Rostro robusto, apice deflexo, hamato : naribus in parte centrali maxillæ : alis longis, remigibus 4 et 5 longissimis, primâ quam secunda 1"·5 brevior : caudâ æquali : pedibus robustis, brevibus : plagâ pulverulenti-lanuginosâ utrinque in uropygii lateribus : sexus coloratine dissimiles.

Bill moderately long, the tip decurved and slightly hooked, gonys straight at the base and curved upwards on the terminal portion ; nostrils not basal, but situated in the middle of the upper mandible, and having a horny plate across the nasal opening ; no bare space behind the eye. Wings rather long and pointed, the fourth and fifth quills longest, the first 1·5 inch shorter than the second and 2·6 shorter than the fourth. Tail long, even. Legs rather short and stout ; feet anisodactyle, but the fourth toe looks inwards and slightly backwards at its apex, there being as it were a slight twist in its axis ; claws moderate, curved, acute. A powder-down patch on each side of the rump, which is absent in all other genera of Rollers. Sexes dissimilar in coloration.—Type *Leptosomus discolor*.

THE present subfamily and genus contain only two very closely allied species, one of which inhabits Madagascar and the other the adjacent island of Grand Comoro. In their habits they are arboreal, therein resembling the true Rollers. They frequent the outskirts of the forests and bush-covered plains. Their flight is strong and tolerably swift, and, like the members of the genus *Coracias*, they frequently, during the pairing-season, execute aerial evolutions on the wing. They feed on insects and small reptiles and nest in the hollows of trees, depositing white eggs.



J.G.Keulemans lith.

ANOMALOUS CUCKOO-ROLLER.
LEPTOSOMA DISCOLOR.

LEPTOSOMUS DISCOLOR.

ANOMALOUS CUCKOO-ROLLER.

Cuculus madagascariensis major, Briss. Orn. iv. p. 160, pl. xv. figs. 1, 2 (1760).

Le Grand Coucou de Madagascar, D'Aubent. Pl. Enl. 587, 588 (1775).

Le Vouron-Driou, Montb. Hist. Nat. Ois. vi. p. 395 (1779); Levaill. Ois. d'Afr. v. pls. 226, 227 (1806); Sundev. Kritik. om Levaill. p. 49 (1857).

African Cuckoo, Lath. Gen. Syn. i. pt. 2, p. 532 (1782).

Cuculus discolor, Herm. Tabl. Affin. Anim. p. 186 (1783).

Cuculus æneus, Bodd. Tabl. Pl. Enl. p. 36 (1783).

Cuculus afer, Gmel. Syst. Nat. i. p. 418 (1788); Lath. Ind. Orn. i. p. 217 (1790).

Bucco africanus, Steph. in Shaw's Gen. Zool. ix. p. 25 (1815).

Leptosomus vourong-driou, Dumont, Dict. Sci. Nat. xi. p. 145 (1818).

Leptosomus viridis, Vieill. Nouv. Dict. xxxvi. p. 251 (1819); id. Tabl. Encycl. et Méthod. iii. p. 1342 (1823); id. & Oudart, Gal. Ois. p. 29, pl. xl. (1825); Lesson, Traité d'Orn. p. 134 (1831); Swains. Classif. of B. ii. p. 333 (1837).

Vourongdriou afer, Kuhl, Fig. Av. Col. Nom. Syst. p. 10 (1820).

Leptosomus afer (Gmel.), Temm. Man. d'Orn. p. lxxiv (1820); Steph. in Shaw's Gen. Zool. xiv. p. 207 (1826); Franklin, Proc. Zool. Soc. 1830, p. 121; Sykes, op. cit. 1832, p. 97; Gray, Gen. of B. iii. App. p. 22 (1849); Bp. Consp. Gen. Av. i. p. 96 (1850); Bp. Consp. Volucr. Zygod. p. 13 (1854); Hartl. Journ. f. Orn. 1860, p. 111; id. Orn. Madag. p. 63 (1861); Roch & E. Newton, Ibis, 1863, pp. 166, 453; Verr. in Vinson's Voy. Madag. Ann. B (1865).

Leptosomus crombus, Less. Traité d'Orn. p. 134 (1831).

Crombus madagascariensis, Reichenb. Meropinae, p. 52, pl. 435. fig. 3190 (1852).

Leptosomus discolor (Herm.), Cab. & Heine, Mus. Hein. iv. p. 57 (1862); Selater, Ibis, 1864, p. 299; Gray, Hand-l. of B. i. p. 77. no. 912 (1869); Hartl. Vög. Madag. p. 255 (1877); Milne-Edw. & Grandidier, Hist. Nat. Madag., Ois. i. p. 224, pls. lxxxiii.-lxxxviii. (1879); Milne-Edw. & Oustalet, N. Arch. Mus. (2) vi. p. 238 (1888).

Leptosoma discolor (Herm.), Selater, Proc. Zool. Soc. 1865, p. 683; A. Newton, Proc. Zool. Soc. 1865, p. 834; Grand. Rev. et Mag. de Zool. 1867, p. 354; Schlegel & Pollen, Faun. Madag. p. 157 (1868); Sharpe, Proc. Zool. Soc. 1870, p. 398; id. Ibis, 1871, p. 285; Shelley, Proc. Zool. Soc. 1879, p. 675; Forbes, Proc. Zool. Soc. 1880, p. 465; Sharpe, Cat. B. Brit. Mus. xvii. p. 1 (1892).

Kiròmbô, Vòrondrèò, in Madagascar.

Figuræ notabiles.

D'Aubenton, Pl. Enl. pls. 587, 588; Levaillant, Ois. v. pls. 226, 227; Vieill. & Oud. Gal. des Ois. pl. 40; Reichenbach, Meropinae, pl. 435. fig. 3190; Milne-Edw. & Grand. Hist. Nat. Madagascar, Ois. i. pls. 83, 84.

HAB. Madagascar, Mayotte, and Anjuan.

♂ *ad.* pileo cristato, nigro-plumbeo viridi tincto: capite reliquo et collo saturatè cinereis: corpore suprà cum alis saturatè et nitidè viridibus cupreo tinctis: remigibus nigricantibus viridi tinctis et in pogonio interno ad basin albis: caudâ nigro-cinereâ, viridi et cupreo tinctâ: corpore subtùs saturatè cinereo, subcaudalibus et subalaribus albidis: rostro nigro-fusco: pedibus aurantiaco-flavidis: iride fuscâ.

♀ *ad.* major: capite et collo rufescentibus nigro fasciatis, pileo fere nigro indistinctè rufescente notato: corpore suprà fusco, sordidè viridi et cupreo nitente, et fulvido notato: caudâ fuscâ, versùs apicem nigricante et fulvido apicatâ: corpore subtùs pallidè cervino viridi-nigro guttato, subalaribus cervino-albidis.

♂ *juv.* foeminæ similis, sed minor, corpore suprà sicut in ♂ adulto sed sordidiore: caudâ fuscâ indistinctè viridi nitente.

Adult male (Imerina, Madagascar).—Head and neck, excepting the crown, dark ashy grey; crown crested, dark blackish plumbeous glossed with green; rest of the upper parts dark iridescent green tinged with copper-red; primaries blackish glossed with steel-green, and at the base of the feathers white on the inner web; tail blackish grey, glossed with green and copper-red; underparts dark ashy grey, becoming nearly pure white on the under tail-coverts and the under surface of the wings: bill blackish brown; legs orange-yellow; iris brown. Total length about 16 inches, culmen 1·5, wing 10, tail 7·8, tarsus 1·2.

Adult female (Imerina, Madagascar).—Head and neck rich reddish barred with black, the crown, however, black, but slightly marked with dark reddish brown; back brown, glossed with dull green and coppery red and spotted with dark reddish brown; wing-coverts more marked with chestnut-red; quills blackish grey, the inner webs white at the base; tail earthy brown, becoming blackish towards the end, and slightly tipped with chestnut-red; underparts pale rufous buff, spotted with greenish black; under wing-coverts buffy white; soft parts as in the male. In size rather larger than the male. Total length about 16·5 inches, culmen 1·6, wing 10·5, tail 8·2, tarsus 1·2.

Young male (Imerina).—Resembles the female, but has the back unspotted and as in the adult male, but much duller in colour, and the tail is rather darker and greyer and slightly glossed with dull green.

THE present species inhabits Madagascar, where it is much commoner than the other aberrant Rollers which are found in that island, and it also occurs on Mayotte and the island of Anjuan, but is replaced on Grand Comoro by a closely allied though specifically distinct form. It has, owing to some strange error, been stated (Franklin, P. Z. S. 1830, p. 121) to have occurred in India and (Sykes P. Z. S. 1832, p. 97) in the Dukhun; but it is scarcely necessary to say that this cannot be correct. There is but very little on record respecting the habits of this Roller, and the best, and in fact the only detailed, account is that given by Grandidier, who writes (*l. c.*) as follows:—"The Cuckoo-Rollers are common birds everywhere in Madagascar, at least where there is wood. It is not found in the arid mountains of the interior, but one of us saw one sailing below the foot of Anton-gadrahøjă. They live in small family-parties of ten or a dozen individuals, which consist always of

more males than females. The young birds remain long with the parents. They frequently fly during the day at great altitudes, soaring like birds of prey in circles above the tree-tops. But during the pairing-season they exhibit the greatest excitement—when they rise from time to time obliquely into the air with violent flaps of their wings, which they then half close and allow themselves to descend to the tree-tops, to again at once ascend, and thus they continue for some time, and then glide, uttering at intervals a mournful and plaintive cry *drèò-drèò*, at the same time puffing out their throats and erecting the feathers on their heads.

“These Rollers are more especially to be met with on the skirts of the forest and on the bush-covered plains, where they hunt after reptiles, insects, grasshoppers, and especially caterpillars, which form their food. They are not shy, and are easily shot when perched on a bough. Towards each other they are sociable, and should one be shot down his companions flutter round the hunter as if to rescue their friend, hovering at a short distance from the ground or perching on a tree close by, so that one can, if one wishes to do so, kill one after the other, almost to the last, without their being scared away by the reports of the gun. When wounded they puff out the skin of the head, erect their feathers, and try to defend themselves by vigorous strokes of the bill, and then assume a defiant and wild appearance.

“They nest in holes in trees, and it seems that their eggs are pure white.

“In the west the Cuckoo-Roller is called *Kiròmbo* (that is, ‘the one who soars’), and in the east *Vòrondrèò* (literally the drèò-bird).

“The Sàkalàvas, impressed by the mournful and languishing song of this bird, prepare a love-potion from certain parts of its body, such as the eye and the wing-feathers. We, on several occasions, lost some fine skins of this bird on account of the carriers having taken some of the feathers, without permission, for this purpose.”

In a letter just received, the Rev. J. Wills sends me the following note respecting this species:—“The native name indicates its call, *Vòrona* (bird) *drèò*, this latter word being the cry of the bird as it flies high above the trees, circling about, the *è* having the sound of the French *è*. The cry is a loud and long-continued *rè-oo, rè-oo, rè-oo*. A native, who tells me that he has taken the eggs and young from the nest, affirms that the nest was on the ground under an overhanging bank, being just a little dried grass loosely spread. The eggs are three in number, but, he says, one is always addled, and he added that these birds feed their young on grasshoppers, lizards, chameleons, &c.”

Messrs. Roch and E. Newton remark (*Ibis*, 1863, p. 166) that “It has a peculiar habit of playing in the air above the forest for some time over the same place, ascending almost perpendicularly, as it were by a jump, to a great height, and descending again in a curve nearly to the top of the trees, by almost closing its wings, at the same time uttering a whistle so like an Eagle’s that it was for a long time doubted by us whether the bird that performed this wonderful freak was not a Raptorial. However, after having several times watched it with our glasses, we satisfied ourselves that it was this species. Whilst one bird was thus playing, another would frequently answer its cry from a tree hard by.”

I have figured the adult male only of this species, as the adult female differs from that of *Leptosomus gracilis* merely in being darker and in having the tail brown and not pale chestnut-red.

The specimens figured and described are in my own collection.

In the preparation of the above article I have examined, besides the series in the British Museum, the following specimens :—

E Mus. H. E. Dresser.

a, ad. Madagascar (*Whitely*). *b*, *c*, ♂ ad.; *d*, ♂ juv.; *e*, ♀ ad. Imerina, Madagascar, 1884 (*Rev. J. Wills*).

E Mus. A. & E. Newton.

a, ♀. Madagascar. *b*, ♂ ad.; *c*, ♀ ? Bavarau, Madagascar. *d*, ♂ ad.; *e*, ♂ juv. Central Madagascar (*E. N.*).

E Mus. W. Rothschild.

a, ♂ ad.; *b*, ♀ ad. Madagascar (*Boucard*).



J.G. Keulemans lith.

LEPTOSOMA GRACILE.
YOUNG.

Hanhart imp.

LEPTOSOMUS GRACILIS.

COMORAN CUCKOO-ROLLER.

Leptosomus discolor, Selater, Ibis, 1864, p. 299; Shelley, P. Z. S. 1879, p. 675 (partim).

Leptosomus gracilis, Milne-Edwards & Oustalet, Compt. Rend. Paris, ci. p. 218 (1885).

Leptosomus discolor, var. *gracilis*, iid. Ann. Sci. Nat. Zool. 1887, art. no. 5, p. 219; iid. N. Arch. Mus. (2) x. p. 239 (1888).

Leptosoma gracile (M.-E. & Oust.), Sharpe, Cat. B. Brit. Mus. xvii. p. 3 (1892).

Figura adhuc nulla.

HAB. Grand Comoro Island.

♂ *ad.* *L. discolori* persimilis, sed minor.

♀ *ad.* *L. discolori* similis, sed conspicuè pallidior: caudâ nec fuscâ, sed pallidè castaneâ versùs apicem nigro-fusco transfasciatâ, facilè distinguenda.

Adult male (Grand Comoro).—Does not differ from the male of *L. discolor* except in size, being smaller. Total length about 15 inches, culmen 1·65, wing 9·5, tail 7·5, tarsus 1·15.

Adult female (Grand Comoro).—Differs from the female of *L. discolor* in being smaller in size, paler in general coloration, and in having the tail pale chestnut or foxy red, with a somewhat indistinct subterminal blackish bar. Total length about 15 inches, culmen 1·5, wing 8·9, tail 7·3, tarsus 1·15.

Young (Grand Comoro).—Resembles the female, but the back is ashy in colour, and the primaries are slightly glossed with green; tail pale chestnut as in the female.

ALTHOUGH the male of the present species, which is confined to the island of Grand Comoro, differs from its near ally *L. discolor* merely in size, the female and young are very easily distinguishable in having the tail pale chestnut or foxy red instead of dark brown; and as this difference is constant there can be no doubt that it is a fairly good species and should be kept apart from *L. discolor*.

In habits, note, and mode of nidification it probably agrees closely with that species, but I find nothing on record respecting these, and indeed, as will be seen from the above synonymy, the information we have respecting this bird is extremely meagre.

As the variations in size may be of interest, I give the following table of measurements of the specimens I have examined of both this species and *Leptosomus discolor*:—

	Culm.	Gape.	Wing.	Tail.	Tarsus.	Middle Toe.	Claw.
LEPTOSOMUS DISCOLOR.							
	in.	in.	in.	in.	in.	in.	in.
Madagascar. ♀. Mus. H. E. Dresser	1·65	1·85	10·6	8·5	1·2	1·3	0·5
Imerina, Madagascar. ♂ ad. Mus. H. E. Dresser	1·5	1·7	10·0	7·5	1·2	1·1	0·38
" " ♂ ad. " 	1·55	1·75	10·2	7·8	1·2	1·2	0·35
" " ♂ juv. " 	1·5	1·65	10·0	7·8	1·2	1·15	0·4
" " ♀ ad. " 	1·6	1·65	10·5	8·2	1·2	1·2	0·4
Madagascar. ♀. Mus. A. & E. Newton	1·95	2·05	10·5	8·5	1·4	1·25	0·35
Bavarau, Madagascar. ♀ ? Mus. A. & E. Newton	1·95	2·0	10·15	8·0	1·2	1·2	0·45
" " ♂ ad. " 	1·7	1·75	9·7	7·9	1·15	1·15	0·38
Central Madagascar. ♂ ad. " 	1·6	1·78	10·3	7·8	1·2	1·05	0·48
" " ♂ juv. " 	1·75	1·88	9·7	7·7	1·2	1·2	0·42
LEPTOSOMUS GRACILIS.							
Grand Comoro. ♂ ad. Mus. H. E. Dresser	1·65	1·85	9·5	7·5	1·15	1·15	0·45
" ♀ ad. " 	1·5	1·75	8·9	7·3	1·15	1·1	0·4
" ♂ ad. Mus. Shelley	1·7	1·85	9·3	7·5	1·15	1·15	0·35
" ♀ ad. " 	1·6	1·75	8·9	7·4	1·1	1·2	0·4
" ♂ ad. Mus. A. & E. Newton	1·6	1·6	8·4	6·8	1·1	1·12	0·4
" ♀ ad. " 	1·65	1·75	8·8	7·1	1·1	1·15	0·42

From the above table it will be seen that *Leptosomus gracilis* has in general a shorter wing than *L. discolor*, and it would also appear that whereas in *L. discolor* the female is generally larger than the male, in *L. gracilis* she is somewhat smaller than the male.

I have not thought it necessary to figure the male of this species, but have figured the female only.

The specimens figured and described are in my own collection, with the exception of the young male, which is in the British Museum.

In the preparation of the above article I have, besides the series in the British Museum, which embraces those in the Shelley Collection, examined the following specimens:—

E Mus. H. E. Dresser.

a. ♂ ad.; *b.* ♀ ad. Grand Comoro, 1878 (*Sir J. Kirk*).

E Mus. A. & E. Newton.

a. ♂ ad.; *b.* ♀ ad. Grand Comoro.

I N D E X.

[Synonyms are printed in italics. When more than one page is quoted for the same entry,
the page referring to the principal entry is placed first.]

Atelornis, *Pucheran*, 91, 85.
 — *cæruleiceps*, *Dresser*, 98.
 — *crossleyi*, *Sharpe*, 97, 95.
 — *pittoides*, *Lafr.*, 93, 91, 98.
 — *squamigera*, *Lafr.*, 89.

Brachypteracias, *Lafr.*, 85, 91.
 — *collaris*, *Pucheran*, 87.
 — *crossleyi*, *Sharpe*, 97, 95.
 — *leptosoma*, *Less.*, 87.
 — *leptosomus*, *Less.*, 87.
 — *pittoides*, *Lafr.*, 93, 91.
 — *squamiger*, *Lafr.*, 89, 85, 88.
 — *squamigera*, *Lafr.*, 89, 85, 88.
 — *squammigera*, *Pucheran*, 89.

Brachypteraciinæ, 85.

Bucco, *Steph.*, 101.
 — *africanus*, *Steph.*, 103.

Chloropyga, *Swainson*, 85.
 — *leptosomus*, *Less.*, 87.

Colaris, *Cuv.*, 51.

Colaris, *Less.*, 85.

— *afra*, *Lath.*, 57.

— *cyanicollis*, *Vieill.*, 68.

— *garrula*, *Guér.-Ménév.*, 68.

— *gularis*, *Vieill.*, 63.

Colaris leptosomus, *Less.*, 87, 85.

— *madagascariensis*, *Herm.*, 53.

— *orientalis*, *Linn.*, 67, 51.

— *pacificus*, *Lath.*, 75.

— *purpurascens*, *Vieill.*, 57.

— *violaceus*, *Vieill.*, 53.

— *viridis*, *Wagl.*, 57.

Coracias, *Linn.*, 1, 51, 101.

— *sp.*, *Boehm*, 13.

— *abyssina*, *Schlegel*, 4.

— *abyssinia*, *Gray*, 4.

— *abyssinica*, *Gmel.*, 3, 7, 24.

— *abyssinica*, *Layard*, 9.

— *abyssinicus*, *Gmel.*, 3, 7, 10, 11, 40, 60.

— *abyssinus*, *Bodd.*, 3.

— *afer*, *Lath.*, 57.

— *afer*, *Gmel.*, 103.

— *affinis*, *McClelland*, 35, 29, 30, 45.

— *afra*, *Lath.*, 57.

— *africana*, *Shaw & Nodder*, 57.

— *albifrons*, *Shaw*, 3.

— *angolensis*, *Bodd.*, 9.

— *assamensis*, *Licht.*, 35.

— *bengalensis*, *Linn.*, 27.

— *bengalensis*, *Bonap.*, 35.

— *bengalensis*, *Keulem.*, 21.

— — *indica*, *Temm.*, 28.

— *benghalensis*, *Bodd.*, 27.

Coracias caudata, Linn., 9, 24.
 — *caudata*, Salvad., 7.
 — *caudata*, Sharpe, 13.
 — *caudata*, Wagler, 3.
 — *caudatus*, Linn., 9, 7, 11, 14, 44.
 — *crinita*, Shaw, 39.
 — *cyanogaster*, Cuv., 47, 1.
 — *cyanogastra*, Cuv., 47.
 — *dispar*, Bocage, 13.
 — *garrula*, Linn., 19, 5, 29.
 — *garrula*, Cord., 28.
 — *garrulus*, Linn., 19, 1, 5, 6, 11, 29, 30.
 — *germanicus*, C. L. Brehm, 20.
 — *glaucopterus*, L. Brehm, 21.
 — *glaucurus*, P. L. S. Müller, 53.
 — *habessinica*, Hempr. & Ehrenb., 4, 40.
 — *indica*, Linn., 27, 23.
 — *indicus*, Linn., 27, 5, 24, 36, 37, 45.
 — *leucocephalus*, P. L. S. Müller, 3.
 — *levaillantii*, Rüpp., 39.
 — *loquax*, Licht., 4, 20.
 — *lorti*, Shelley, 7, 11.
 — *madagascariensis*, Herm., 53.
 — *mosambica*, Dresser, 43.
 — *mosambicensis*, Dresser, 46.
 — *mosambicus*, Dresser, 43, 41.
 — *nævia*, Daud., 39, 44.
 — *nævia*, Bianc., 9.
 — *nævia*, Dumont, 43.
 — *nævia*, Wagler, 28.
 — *nævia levaillantii*, Shelley, 43, 45.
 — *nævius*, Daud., 39, 43, 44, 45, 46.
 — *nævius*, Shelley, 43.
 — *nuchalis*, Swainson, 39.
 — *nuchalis*, Layard, 43.
 — *olivaceiceps*, Sharpe, 43, 44, 46.
 — *orientalis*, Linn., 67.
 — *orientalis*, Bodd., 53.
 — *pacifica*, Lath., 75.
 — *papuensis*, Quoy & Gaim., 49.
 — *pileata*, Blyth, 49.
 — *pilosa*, Lath., 24, 39, 43.
 — *pilosus*, Lath., 11, 60.
 — *planiceps*, C. L. Brehm, 20.
 — *senegala*, Lath., 3.
 — *senegalensis*, Gmel., 3.
 — *spatulata*, Trimen, 13.
 — *spatulata*, Tristram, 17.
 — *spatulatus*, Trimen, 13, 11, 17, 18.
 — *spatulatus*, Sharpe, 17.
 — *temmincki*, Vieill., 49.
 — *weigalli*, Dresser, 17.
Coraciidæ, 1.
Coraciinæ, 1.
Coraciura, Bonap., 1.
 — *abyssinia*, Gray, 4.

Coraciura abyssinica, Gmel., 4.
 — *caudata*, Linn., 9.
 — *cyanogaster*, Cuv., 47, 1.
 — *cyanogastra*, Cuv., 47.
Coracopitta, Sharpe, 91.
 — *pittoides*, Lath., 93.
Corapitta, Bonap., 91.
 — *pittoides*, Lath., 93, 91.
Cornopio, Cab. & Heine, 51.
 — *afer*, Lath., 58, 51.
 — *glaucurus*, P. L. S. Müller, 53.
 — *gularis*, Vieill., 63.
 — *madagascariensis*, Gmel., 53.
Crombus, Reichenb., 101.
 — *madagascariensis*, Reichenb., 103.
Cuculus, Herm., 101.
 — *æneus*, Bodd., 103.
 — *afer*, Gmel., 103.
 — *discolor*, Herm., 103.
 — *madagascariensis major*, Briss., 103.

Eurystomus, Vieill., 51.
 — *afer*, Lath., 57, 51, 54, 64.
 — *afer*, var. *rufobuccalis*, Reichenow, 58, 60.
 — *afra*, Lath., 57.
 — *australis*, Swainson, 75, 78.
 — *azureus*, Gray, 83.
 — *calonyx*, Hodgs., 68, 70.
 — *calornyx*, Hodgs., 68.
 — *collaris*, Vig., 63.
 — *crassirostris*, Selater, 79, 71, 77, 81.
 — *crassirostris*, D'Albertis, 75.
 — *crassirostris*, Gray, 81.
 — *cyanocollis*, Vieill., 67, 68.
 — *fuscicapillus*, Vieill., 67.
 — *glaucurus*, P. L. S. Müller, 53.
 — *gularis*, Vieill., 63, 58.
 — *gularis*, Rosenb., 75.
 — *lætior*, Sharpe, 68, 70.
 — *madagascariensis*, Gmel., 53.
 — *orientalis*, Linn., 67, 51, 76, 77, 79, 80.
 — *orientalis*, Meyer, 83.
 — *orientalis*, Rüpp., 57.
 — *orientalis*, Vig. & Horsf., 75.
 — *pacifica*, Lath., 75.
 — *pacificus*, Lath., 75, 64, 70, 71.
 — *pacificus*, Motl. & Dillw., 68.
 — *pileatus*, Blyth, 49.
 — *purpurascens*, Vieill., 57.
 — *rubescens*, Vieill., 57.
 — *salomonensis*, Sharpe, 81, 77, 80.
 — *violaceus*, Vieill., 53.
 — *viridis*, Wagl., 57.
 — *waigiouensis*, Elliot, 79.

Galgulus, Brisson, 1, 19, 51.

—— *angolensis*, Briss., 9.

—— *caudatus*, Linn., 9.

—— *caudatus*, Vieill., 3.

—— *cyanogaster*, Cuv., 47.

—— *garrula*, Linn., 20.

—— *garrulus*, Linn., 20.

—— *indica*, Linn., 28.

—— *indicus*, Briss., 67.

—— *mindanoensis*, Briss., 27.

—— *nævius*, Vieill., 28.

—— *pacificus*, Lath., 75.

—— *pilosus*, Lath., 39.

—— *temmincki*, Vieill., 49.

Garrulus cyanogaster, Cuv., 47.

—— *nævius*, Vieill., 28.

—— *temminckii*, Vieill., 49.

Geobiastes, Sharpe, 85.

—— *squamiger*, Lafr., 89.

—— *squamigera*, Lafr., 89, 85.

Leptosoma discolor, Herm., 103.

—— *gracile*, Milne-Edw. & Oust., 107, 108.

Leptosominæ, 101.

Leptosomus, Vieill., 101.

—— *afer*, Gmel., 103.

—— *crombus*, Less., 103.

—— *discolor*, Herm., 103, 101, 107, 108.

—— *discolor*, Sclater, 107.

—— *discolor*, var. *gracilis*, Milne-Edw. & Oust., 107.

—— *gracilis*, Milne-Edw. & Oust., 107, 105.

—— *viridis*, Vieill., 103.

—— *vourong-driou*, Dumont, 103.

Vourongdriou afer, Kuhl, 103.



